



**ABOVE** • Thousands of children from area hospitals and social service programs enjoy night at the circus, courtesy of R&W. See p. 12.

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# nih record

## STEP Forum Explores Natural Product Drug Discovery

By Belle Waring

**Y**our cold capsule. Dad's aspirin. Nana's eye drops. We may take such therapies for granted, but safe and effective medications don't grow on trees—or do they? In fact, their sources may. Since modern chemistry has not kept pace with the need to treat many illnesses, scientists are returning to nature as the inspiration for new drugs.



Panel members include (from l) Dr. Alice Clark of the University of Mississippi, Dr. William Gerwick of the Scripps Institution of Oceanography at UC-San Diego and NCI's Dr. Gordon Cragg.

“The NIH has always played an important role in the discovery of drugs to improve public health,” moderator Chris Ketchum told the crowd in Natcher Conference Center, where a recent Staff Training in Extramural Programs (STEP) forum explored “Drug Discovery: Is Nature the Answer?”

Ketchum welcomed panelists Dr. Alice Clark of the University of Mississippi, Dr. William Gerwick of the Scripps Institution of Oceanography and Skaggs School of

SEE NATURAL PRODUCTS, PAGE 6



Sanaa Ibrahim can eat and drink again, thanks to an NINDS study.

### Iraqi Woman Has Early Success in Dysphagia Study

By Shannon E. Garnett

Since suffering a stroke in May 2003, Sanaa Ibrahim—an Iraqi pharmacist and mother of three—had been unable to swallow anything. For 4 years she tried numerous treatments to no avail. Her search for an effective therapy led her to the United States, where she eventually entered Dr. Christy Ludlow's clinical trial, “Comparison of an Implanted Neuroprosthesis with Sensory Training for Improving Airway Protection in Chronic Dysphagia.” Today Ibrahim is nearly back to normal.

“This experiment has changed my life,” she said. “I was using a feeding tube through my stomach to eat. I couldn't even taste the food.”

SEE DYSPHAGIA, PAGE 4

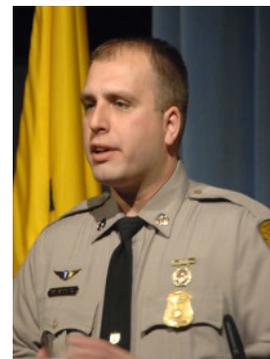
### On the Front Lines Panel Highlights Urgent Challenges Of Emergency Medicine

By Sarah Schmelling

The specifics of what happens in a traumatic injury—from the scene of an accident to treatment in a trauma unit—is not something many of us may want to think about outside of, say, an episode of *ER*. But, as the audience of a STEP forum on this topic learned recently, emergency medicine is a constantly evolving field that deserves our attention not just because of its connection to medical research, but because of the frequency at which these injuries happen and how often trauma specialists save lives.

At the forum, “Surviving Traumatic Injury: Improving the Odds,” paramedics, researchers

SEE EMERGENCY MEDICINE, PAGE 8



Trooper First Class Jimmie Meurrens



The NIH Record is published biweekly at Bethesda, MD by the Editorial Operations Branch, Office of Communications and Public Liaison, for the information of employees of the National Institutes of Health, Department of Health and Human Services. The content is reprintable without permission. Pictures may be available upon request. Use of funds for printing this periodical has been approved by the director of the Office of Management and Budget through September 30, 2008.

To receive alerts to our latest issue, send an email to [listserv@list.nih.gov](mailto:listserv@list.nih.gov) with the words "Subscribe NIHRECORD" in the message body.

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The NIH Record reserves the right to make corrections, changes or deletions in submitted copy in conformity with the policies of the paper and HHS.

## briefs

### Council of Public Reps Meets, Apr. 18

The 19th meeting of the NIH Director's Council of Public Representatives (COPR) will be held on Friday, Apr. 18 from 9 a.m. to 4:45 p.m. in Bldg. 31, 6th floor, Conf. Rm. 6. The meeting is open to the public. To view the meeting agenda, visit the COPR web site at <http://copr.nih.gov/meetings.asp>.

### caBIG Fifth Annual Meeting, June 23-25

The upcoming caBIG annual meeting has been organized by NCI's Center for Biomedical Informatics and Information Technology. On day 1, attendees will learn the basics about NCI's cancer Biomedical Informatics Grid (caBIG) and how it can help accelerate biomedical research. Day 2 offers insight into caBIG and how it is already driving changes in biomedical research for investigators and institutions across the country. The third day includes a look "under the hood" of caBIG and what it can do for you. The meeting will be held at the Omni Shoreham Hotel, Washington, D.C. Register at <https://cabig.nci.nih.gov/2008AnnualMeeting/>. The meeting is free and open to the public.

### Evolution and Medicine Lecture Series 2008

The National Institute of General Medical Sciences and the Office of Science Education are partnering to present the third annual lecture series, Evolution and Medicine—An Exploration of the Evolutionary Foundations of Contemporary Medical Research. An outstanding group of scientists will present lectures on evolution as it applies to their area of expertise. The program is open to all employees and the public.

May 13 - Evolution and Human Genetic Diversity: Tales from Africa, Dr. Sarah Tishkoff, University of Pennsylvania

May 27 - Evolution and the Concept of Species, Dr. Mohamed Noor, Duke University

June 10 - Evolution and Biological Systems, Dr. Christopher Marx, Harvard University

June 24 - The Evolution of Protein Structure and Function, Dr. Joe Thornton, University of Oregon

All lectures take place in Natcher balcony B, from noon to 1 p.m. An informal discussion period will follow. American Sign Language interpreters will be available on request. If you require this or other reasonable accommodation to participate, contact OSE at least 5 days before the event at [moorec@mail.nih.gov](mailto:moorec@mail.nih.gov), (301) 402-2470 or the Federal Relay, (TTY) 1-800-877-8339.

### NIH Earth Day Celebration 2008

Just a reminder that NIH's observation of Earth Day will take place Thursday, Apr. 24 from 10 a.m. until 2 p.m. in front of Bldg. 1. Purchase lunch from Potomac Pizza, Chick-fil-A or bring your own. A map and list of all NIH Earth Week activities can be found at [nems.nih.gov](http://nems.nih.gov).

NIH Earth Day will be a celebration with activities and information for NIH employees, contractors, visitors and children here for Take Your Child to Work Day. Events for children and adults include:

- Learn about the environment and how to protect it (10 a.m.-2 p.m.)
- Take the Environmental Quiz for Green Prizes (10-2)
- Receive an Earth Day Certificate (10-2)
- Frisbee Contest (11 a.m. and 1 p.m.)
- Plant seeds to take home or help plant the NIH Wildflower Garden (10-2)
- Take an NIH Nature Tour (10 a.m., noon and 2 p.m.)
- Take part in the 3-D watershed demonstrations (10-2)
- Meet Ben Franklin, the Mad Hatter and clowns (10-2)
- Children's Solar Oven Pizza Box Contest (must pre-register at [takeyourchildtowork.nih.gov](http://takeyourchildtowork.nih.gov)).

### National Day of Prayer, May 1

This year's National Day of Prayer will be observed Thursday, May 1 from 11:30 a.m. to 1 p.m. on the lawn in front of Bldg. 1. All are welcome. The program includes guest speakers, music and prayer.

### NIH 9-Hole Golf League Recruits

The NIH 9-Hole Golf League is seeking members for the 2008 season. The league features two flights of mildly competitive, handicapped-match play and one non-competitive flight. The season starts the first week of May and continues through September. Play is after work on Tuesdays and/or Thursdays. The league has a block of reserved tee times (generally 4:15-6 p.m.) at Needwood Golf Course in Rockville (Tuesdays) and at Northwest Park Golf Course in Silver Spring (Thursdays). The league is open only to R&W members (who may be non-employees). Membership is limited to the first 84 registrants. For more information, visit [www.recgov.org/golf](http://www.recgov.org/golf) or email John Hamill at [jhamill@mail.nih.gov](mailto:jhamill@mail.nih.gov).



## New Horizons For Vaccines Is Subject of LaMontagne Lecture

By Anne Oplinger

Dr. Rino Rappuoli would like people to think of vaccines in a new way. We all know vaccines as safe and effective ways to prevent childhood illnesses, he notes. Indeed, 21st-century parents and pediatricians in developed countries are unlikely to ever see cases of polio, measles, mumps, tetanus or diphtheria, thanks to vaccines. Now, says Rappuoli, we are entering an age when vaccines should be viewed as a kind of lifelong health insurance, as cost-effective interventions to guard against conditions such as cervical cancer and hypertension that typically strike in later years.

Rappuoli will present this argument at the 2008 John Ring LaMontagne Memorial Lecture in Lipsett Amphitheater, Bldg. 10 on Tuesday, May 6 at 2 p.m. Rappuoli is based in Siena, Italy, and is global head, vaccines research, for Novartis Vaccines and Diagnostics, a position he has held since 2006.

Rappuoli's innovative research centers on disease-causing bacteria, including the microbes that cause pertussis, cholera and meningococcal meningitis. In the mid-1980s, while at the Scavo Research Center in Siena, he led research that resulted in the first recombinant bacterial vaccine against whooping cough (which is caused by *Bordetella pertussis*). The mutant form of pertussis toxin used in the vaccine was the first protein constructed by rational drug design to be approved for use in people. Currently, Rappuoli is working on a vaccine against group B meningococcus. Meningococcal meningitis, he notes, is one of few remaining infectious diseases that can sicken and kill otherwise healthy children and young people in a matter of hours. It, too, is in the crosshairs for elimination through vaccination.

When deciding the worth or price of vaccines, Rappuoli urges the scientific community and others to look beyond their immediate cost-effectiveness in reducing or eliminating health care costs directly associated with treating disease. Instead, a broader conception of their benefit should be employed. Imagine, he says,

if parents were offered the chance to buy insurance that would—with 90 percent certainty—assure their newborn of 70 years of life free not only from childhood illnesses, but also from certain forms of cancer or other diseases. Parents, Rappuoli says, would likely see this as a valuable proposition. A shift in mindset by manufacturers, policy makers and vaccine users focusing on long-term benefits has begun, he says, and should lead to a true valuation of these extraordinary products.

The John Ring LaMontagne Memorial Lecture honors contributions made to NIAID by LaMontagne over the course of a 30-year career with the institute. He was the institute's first influenza program officer as well as director of NIAID's Division of Microbiology and Infectious Diseases. He served as NIAID's deputy director from 1998 until his untimely death in 2004. His leadership and accomplishments in fighting emerging and re-emerging infectious diseases earned him international recognition, numerous accolades and widespread admiration. 📍



## Giggles Theater Grand Opening at Inn

On hand Mar. 10 at the grand opening of Giggles Theater at the Children's Inn at NIH were (from l) Dr. Nadia Zerhouni, Kathy L. Russell, the inn's chief executive officer, Frank J. Brady, co-founder and chairman, Medical Missions for Children, and NIH director Dr. Elias Zerhouni. In the foreground is the Giggles Bear. The event promoted laughter as the best medicine. Live performances will be offered to families staying at the inn in the hopes of lifting their spirits after a day of medical treatments at NIH. The shows will be taped and re-broadcast to children at hospitals throughout the country through the support of Medical Missions for Children, a nonprofit organization in New Jersey that initiated the Giggles Theater.

## DYSPHAGIA

CONTINUED FROM PAGE 1



*As a participant in Dr. Christy Ludlow's dysphagia study, Ibrahim uses a vibrotactile device to regain her swallowing and now is able to drink liquids and eat solid food again.*

But now I am almost back to normal. I got rid of the feeding tube and I can taste food and drinks, and eat in public with my family again.”

Although it is too early to declare the study a success, cautions principal investigator Ludlow, a senior scientist in the laryngeal and speech section of NINDS's Medical Neurology Branch, the results thus far are promising.

Begun in April 2007, the study evaluates two devices to find which is better at improving swallowing and reducing the risk of choking in people who develop chronic swallowing problems after brain injury such as stroke. One device is an implanted stimulator that has a controller in the chest and can stimulate up to eight muscles to assist in swallowing. The other is a vibrotactile device that is strapped to the outside of the throat near the larynx and provides sensory stimulation when the user tries to swallow.

In the study, participants are randomized to one of the two device groups. Participants practice swallowing with their device set in patient-controlled mode each day for an hour and then use either device set in automatic mode or “saliva mode” to remind them to swallow every 3-5 minutes.

Dysphagia is a common disorder caused by brain damage following stroke, traumatic brain injury or tumor removal and is also seen in people with neurodegenerative disorders such as Parkinson's disease. People with dysphagia have difficulty swallowing and may experience aspiration, i.e., food or liquid going into the windpipe while swallowing. Some people may be completely unable to swallow or may have trouble swallowing liquids, food or saliva.

According to Ludlow, people at risk of choking on fluid or food for several weeks or months face a significant risk of aspiration pneumonia and must be fed by tube with restricted intake by mouth. The survival rate in these cases is estimated to be only 17 percent after 3 years.

The goal of her study is to increase survival and quality of life for people with dysphagia by using the devices in an extensive retraining program to reduce the risk of aspiration and improve swallowing function. The study is significant because it is a unique approach to swallowing therapy. It involves teaching participants to retrain themselves to swallow in their own environment and with the help of their families.

“This is a highly intense program of swallowing retraining done by patients in their own homes every day for many months,” Ludlow explained. “This way they get practice on about 260 swallows each day. This is a different approach to traditional therapy. Currently, most patients get 1 hour per day for up to 2 weeks of swallowing therapy with a speech pathologist. [That] does not seem intense enough or long enough to retrain swallowing when it is lost following brain injury.”

The idea for the devices was developed based on years of studying the biomechanics of swallowing, experimental muscle stimulation and research looking at long-term muscle stimulation implants in animals. “We also found, through neuroimaging, that sensory stimulation will increase activity in the swallowing network in the brain, and we came up with the idea of using a sensory stimulator to help trigger swallowing,” said Ludlow.

Of the people who have entered the study thus far, two have reported partial success—one with the implant and the other using the vibrotactile device. “We haven't had a chance to objectively re-evaluate any of the patients yet,” Ludlow noted.

According to Katie Dietrich-Burns, a research speech pathologist in the laryngeal and speech section and a member of Ludlow's team, “Sanaa Ibrahim has been an ideal subject. She entered the study with realistic expectations. Her determination and supportive family keep her motivated and she continues to practice swallowing with the device on a consistent basis.”

Before entering the study, Ibrahim tried many other therapies including thermal and electrical stimulation, dilation and herbs. “It was useless,” she said. “I was using a feeding tube until I started this therapy, which cured me up to 80 percent after just 1 month of treatment. And now I can swallow fluids and semi-fluids. I removed the feeding tube and I am still using the device in hopes of regaining my swallowing 100 percent.”

Ibrahim, now living in Nigeria, continues to participate in the study because she has difficulty with saliva control. She now uses the vibrotactile device in the “saliva mode” to retrain control. Ludlow and Dietrich-Burns are evaluating and monitoring the progress of other study participants as well as recruiting new people for the study. ●

## Women's History Month Reflects on Women's Art, Vision

By Jenny Haliski

Expression, understanding, transformation. These are some of the qualities women bring to the art of science as celebrated at the 2008 NIH Women's History Month observance, whose theme was "Women's Art: Women's Vision."

In a keynote presentation titled, "Art therapy: A vision into our internal world," Megan Robb, an art therapist in the recreation therapy section of the Clinical Center rehabilitation medicine department, shared how art therapy—a women-dominated field—can lead people through a creative process to help them heal, resolve conflicts, develop interpersonal skills, manage behavior, reduce stress and improve self-esteem and awareness.

Quoting statistics published in February 2008 by the Centers for Disease Control and Prevention, Robb said 1 in 4 U.S. women experience domestic violence: 1,200 women are killed and 2 million are injured annually as a result. This trauma creates a permanent health risk for survivors, especially in how they respond to stress, Robb said. Because trauma is often stored in the brain as an image rather than words, art therapy accesses those memories in a unique way and creates an external representation of the trauma that an individual can release. NIA acting deputy director Dr. Taylor Harden, who introduced Robb, emphasized the gift that art therapists can give patients by taking the art, which often represents pain, away from them.

Music therapists, most of whom are also female, know the power of lilting tones of speech, according to CC music therapist Sheila Egan. "Mother-ese," the cooing moms use when speaking to their babies, is a recognized tongue that introduces humans to language skills, she said. Egan said her role is to create a moment of normalcy for CC patients in abnormal situations by using music to bring patients and families to a more centered place and reduce their anxiety. She played several musical selections for the group to demonstrate how different sounds can relax or animate the listener.

CC Chief Operating Officer Maureen Gormley, who gave opening remarks and moderated the event, noted the "balance of creativity, empathy and intellect that women bring to their work." NCCAM director Dr. Josephine Briggs concluded the event by noting the "enormous value for health and wellness of interventions that produce a centeredness," such as music and art therapy.



In remarks dedicating the occasion to Dr. Vivian Pinn, director of NIH's Office of Research on Women's Health, Sen. Barbara Mikulski (D-MD) said that when she entered the U.S. Senate in 1986, she was one of only two female senators and women's health was not a national priority. Today there are 16 female senators working together on a bipartisan basis to add to the legacy of women's history and Pinn's office is "world-renowned," she said. Mikulski thanked Pinn for "all you do every day to improve the health status of women in the United States and to keep the dream of America alive for all our daughters." 🗳️

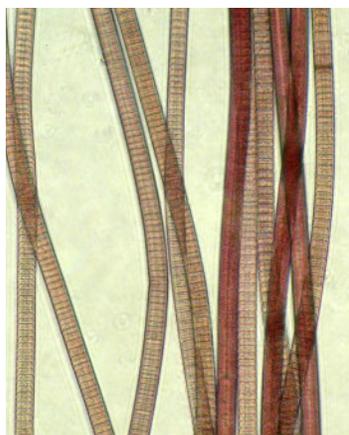
### Top:

On hand at the women's history observance were (from l) Sheila Egan, Clinical Center music therapist; Dr. Josephine Briggs, NCCAM director; and Megan Robb, CC art therapist.

### Above:

Clinical Center recreation therapists (from l) Renee Stubbs, Natalie Haynes, Karen Perkins and Donna Gregory attended the Women's History Month event.

PHOTOS: MICHAEL SPENCER



## NATURAL PRODUCTS

CONTINUED FROM PAGE 1

### Top, l:

*Lyngbya bouillonii* is among the cyanobacteria, or blue-green algae, harvested as a possible source of new drug therapies.

### Top, r:

The “snapping shrimp” is one of the characters in the saga of natural products used in drug discovery.

PHOTOS (ABOVE): DRs. WILLIAM GERWICK AND R. CAMERON COATES

NIH PHOTOS: MIKE SPENCER

Pharmacy and Pharmaceutical Sciences at UC-San Diego, Dr. Peter Lipsky of NIAMS and NCI’s Dr. Gordon Cragg. Together they tackled the scientific, technical, ethical, legal and economic aspects of bringing a natural product from discovery to market.

In a comprehensive overview, Clark led with definitions (see sidebar) and likened natural product (NP) drug discovery to navigating a maze. Challenges include shortages in bulk supply; multiple compounds must be teased apart in “bioassay directed fractionation”; and the eternal question—funding. Her timeline of the odyssey from discovery through clinical trials and finally to market “looks very nice and linear,” she cautioned, but the process is intricate and the tab runs high.

“To get a single chemical entity ready for a human clinical trial,” she said, “costs \$750 million to \$1 billion and takes from 10 to 15 years.” She called for getting more NPs into the pipeline both as potential treatments and “as probes for exploring cell biology.”

Are there computer algorithms for isolating NP compounds? No, Clark said. Nonetheless, the scientific process demands that compounds be isolated and tested singly. “That’s the heart of natural product work.”

Gerwick told tales of “bio-prospecting from the field”—in this case, the ocean.

“It’s a great time to be a natural products chemist,” he said, touting marine microorganisms as “very rich.”

Consider the sponge. Not the rectangular store-bought kind, but the sea sponge, a primitive invertebrate. These squishy critters are the source of many promising leads for the treat-

ment of cancer and other diseases; a small colonial ocean creature called a bryozoan yields the source for bryostatin, now under investigation as an anti-cancer agent.

“Another stunning discovery,” said Gerwick, “is the sea hare, a marine mollusk that feeds on cyanobacteria [blue-green algae].” These ancient inhabitants of diverse ecosystems possess “a virtuosic ability to create molecules” and yielded the dolastatins, several of which show promise as potential anticancer drugs. They are the Earth’s oldest natural products chemists. However, there is growing evidence that, in both of these cases as well as many more, the actual producers of these potentially useful medicines are bacteria, including cyanobacteria that live in association with, or are eaten by, marine invertebrates.

“The point,” he continued, “is that these are giving us fundamentally new chemotypes,” some of which have “fantastic biological activity.” Along with his team, Gerwick’s mission is to find, retrieve, preserve and analyze these samples—assuming the scientists can evade saltwater crocodiles in murky mangrove water.

It’s not just the level of basic supply, he said, where things get complicated. When an NP has unusual structural features, how do you characterize the genes involved in its biosynthetic pathway and their encoded enzymes? “There are lots of problems,” he says, “but it’s exciting.”

NIAMS’s Dr. Peter Lipsky observed that, when introducing NPs to the bedside, he saw in his colleagues a “prejudice difficult to overcome, especially in clinical settings.” Yet “surveys show that between two-thirds to three-quarters of our patients take natural products...[which can generate] an ‘us-versus-



Dr. Peter Lipsky said natural products have a rich history in medicine.

them' mentality." His talk worked to bridge that gap.

In rheumatology, "there's a rich history of borrowing drugs from every area," he said, "and some of the ones that get used come from natural products." That history continues with the thunder god vine (in Chinese, *lei gong teng*).

The vine, which can reach almost 40 feet, produces white flowers and red fruit with three "wings." The leaves, flowers and outer skin of the root are poisonous, but the root pulp is used medicinally and has a centuries-old history in Chinese herbal medicine.

"The Chinese use it to treat fever, lupus, rheumatoid arthritis, worms and inflammation," said Lipsky. But there are problems: "No quality control. No two [samples] are the same and there are few controlled studies. No mechanistic studies to see how it works. Yet [the Chinese] have enormous clinical experience suggesting that something [therapeutic] is going on."

He tackled those problems both logistically and scientifically, and for the first time *lei gong teng's* anti-inflammatory actions and active components were investigated and summarized according to Western standards.

Lipsky shepherded the drug through phase 2a/2b clinical trials, but "we needed a stable source for phase 3. Going to China got problematic." Rutgers University experts developed a way to grow the vine hydroponically in greenhouses, then to clone it for high production. And now, Lipsky said, "We believe the FDA may approve." Thunder god vine holds significant promise.

NCI's Cragg, former chief of the Natural Products Branch in the Developmental Therapeutics Program, brought historical, legal and ethical aspects to bear on the question of NP drug discovery.

"We need to recognize the contributions of traditional knowledge," he said. "This can be abused; we've got to be aware of that." For example, turmeric, long used in Ayurvedic medicine in wound-healing, became U.S. patent 5,401,504 until the Indian government filed, and won, a challenge on the grounds that the patent lacked novelty.

"Researchers should be aware of traditional knowledge associated with their products," Cragg stressed, "and respect [intellectual property rights]." He pointed out how the U.N. Convention on Biological Diversity, with 150 signatories, "was never ratified by the U.S. Senate... yet because it covers conservation, sustainable use and equitable sharing of benefits, it stands as an important international treaty.

"We must share with the host countries," he stressed, "because they do the conservation."

And they have sovereignty over their own biological resources. Cragg and NCI's Dr. David Newman worked with colleagues at the NCI Technology Transfer Center to develop the NCI Letter of Intent, later to become Letters of Collection, as well as memoranda of understanding and tech transfer agreements for benefit-sharing; these serve in basic and commercial research agreements.

NCI has also invited scientists from 65 source countries to visit NCI-Frederick and hosted scientists from 22 countries for training and collaboration. The exchange is a fruitful one.

"NCI helped get the cancer cell line screening program involving NP drug discovery going at the Federal University of Ceara in Fortaleza, Brazil...the university collaborates with many centers in Brazil, where there is great biodiversity," Cragg reported. "It takes high ethical standards and a lot of good will and trust."

In the panel discussion, Lipsky chimed in on the global note: "The advances made in drug discovery are unavailable to 90 percent of the world's population," he said. "The opportunity to develop botanical extracts, besides providing for us, could also offer high quality drugs for the rest of the world. We have a moral obligation to pursue that." ①

### Natural Product vs. Drug

A **natural product** is an organic compound, one produced by a living organism, probably to improve its chances of survival. For example, a flower's vivid color and aroma attract pollinating insects. By legislation, some botanicals are categorized as dietary supplements, not drugs. Intended as dietary supplements, they cannot legally make "drug claims."

A **drug**, according to the FDA, is an article to be used in the diagnosis, cure, mitigation, treatment or prevention of disease.

## EMERGENCY MEDICINE

CONTINUED FROM PAGE 1



### Right:

Dr. Rao Ivatury of Virginia Commonwealth University provided an overview of current trauma management.

### Below:

Involved in the STEP forum presentation were (from l) co-chairperson Dr. Prabha Atreya of NIBIB, Ivatury, co-organizer Dr. Laura Moen of NIDDK, Dr. Guy Clifton of the University of Texas Medical School, Dr. Ronald Tompkins of Harvard Medical School, Dr. Aurelio Rodriguez of Drexel University College of Medicine, co-chairperson Dr. Christopher Hatch of NCI, Trooper Meurrens and First Sergeant Tobin Triebel of the Maryland State Police, and co-organizer Dr. Michael Small of NCI.

PHOTOS: BILL BRANSON

and trauma surgeons provided real-life examples to demonstrate exactly what happens from the first 911 call throughout hospital care. Specialists also provided updates on diagnosis and treatment for problems such as blunt aortic injury and burns.

While many of the examples—which often included film footage—were not for the weak of stomach, it quickly became clear just how complicated and important this high-pressure work can be.

In an overview of current trauma management, Dr. Rao Ivatury, professor of surgery and emergency medicine and physiology at Virginia Commonwealth University, stressed this point with statistics. The leading cause of death in the first four decades of life in the U.S. is unintentional injury, he reported. This death rate has been increasing; the 2006 estimate is 38 percent greater than the rate in 1992. Part of the issue is that patients who in the past would not have made it to the hospital are now able to get there, thanks to efficiencies in paramedic treatment. Trauma surgeons are doing their best to keep up with the increasing numbers by re-evaluating old methods, utilizing current research and looking for ways to bring new concepts into practice.

“We have made a lot of accomplishments,” Ivatury said, “but we still have a lot of things to learn because modern treatment of trauma is pushing the boundaries of survival.”

In a talk that made all of this even more immediate, Trooper First Class Jimmie Meurrens, a flight paramedic and instructor for the Maryland State Police Aviation Command, played

a series of calls to 911 and between dispatchers and paramedics after a traffic accident. A man had been hit by a car and lay in the middle of the street. One caller assumed the man was already dead.

Though Meurrens showed slides during the recordings, no photo was needed to capture the urgency of the calls. “This is EMS,” or emergency medical services, he said. “This is what we have to do out there on a daily basis.”

Modern EMS services are a relatively recent phenomenon, he explained. Though credit for the first “pre-hospital” system is often given to Napoleon’s army in the late 18th century, it wasn’t until 1966, when the National Academy of Sciences put out a white paper on accidental death and disability, that people really began paying attention. The authors found that ambulances were ill-equipped and inappropriately designed and that personnel were inadequately trained: at the time, 12,000 morticians were providing 50 percent of the nation’s ambulance services. The American Ambulance Association then reported that as many as 25,000 people a year may have been permanently disabled due to mishandling by poorly trained ambulance personnel. In the wake of this news, “we began to first see commonly recognized training throughout the country,” Meurrens said.

He provided background on the guiding principles of EMS: the familiar, six-pronged Star of Life for on-scene care; the “ABCs,” focusing on



the key issues of airway, breathing and circulation; and the concept of the “Golden Hour,” the principle that if someone’s injured, he or she needs to be in definitive surgical care within an hour or will likely die. This concept was developed by Dr. R. Adams Cowley, known as the “father of trauma care.” The idea was so pioneering that the Shock Trauma Center at the University of Maryland, where he did this work, is now named for him.

In many ways, Maryland is a leader in emergency services. It had the first statewide EMS system, which has been used as a model around the country and the world, and the Maryland State Police was the first to perform a civilian medevac—using a helicopter to transfer patients from the scene of an accident to a trauma center.

Meurrens, who, as a flight paramedic, knows all about this form of transport, returned to the story of the man hit by a car to demonstrate the potential power of using helicopters, as well as other advanced methods of emergency treatment. It seems the “man” was actually a 14-year-old boy who snuck out of his house to see his girlfriend and was struck by a car while crossing a road.

“When I got there he was unconscious, unresponsive, he was breathing poorly...he had abrasions on his chest and abdomen, he had a broken leg, he was just in a horrible state of disrepair,” Meurrens said. They were about an hour and a half away by car from the local trauma center, but by air, only 26 minutes. Meurrens administered necessary procedures and transferred him immediately to Baltimore’s Shock Trauma Center. “Within minutes there he was taken to the operating room to relieve the blood and swelling that started to develop.”

Today, the boy has made a full recovery. “He’s on the track team, running a 6-minute mile,” Meurrens said, adding that he tries to imagine how he would feel about this boy if he was a son or brother. “How would he have fared if he had to take an hour and half trip up the street? I fully believe that this case clearly demonstrates how the partnership between field EMS, helicopter EMS and trauma centers saves lives.”

## Verma Named NCI Branch Chief

Dr. Mukesh Verma has been named chief of the Methods and Technologies Branch (MTB) of the Epidemiology and Genetics Research Program (EGRP) in the Division of Cancer Control and Population Sciences, NCI. MTB focuses on developing and improving methods for epidemiologic data collection, study design and analysis; on modifying approaches developed in the context of other research endeavors for cancer epidemiologic settings; and on methods to increase understanding of cancer susceptibility. The branch also manages EGRP’s Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.



Verma joined EGRP as a program director in 2004. In 2005, he was appointed acting chief of the former Analytic Epidemiology Research Branch. He then was named acting chief of MTB and the Host Susceptibility Factors Branch, for which he continues to serve as acting chief.

He is responsible for developing EGRP’s initiative to stimulate research on epigenetic approaches in cancer epidemiology and has been instrumental in developing epigenetic research for NIH as a whole. He helped to develop a request for applications on environmental influences on epigenetics with NIEHS and represents DCCPS in NIH’s Roadmap Initiative on epigenetics.

Before joining EGRP, Verma was a program director in NCI’s Division of Cancer Prevention, where he worked in the areas of biomarkers, early detection, risk assessment and prevention. He also was coordinator of the division’s SBIR/STTR programs.

He holds an M.Sc. from Pantnagar University, a Ph.D. in the field of host-virus interaction from Banaras Hindu University and did postdoctoral research at George Washington University.

## Mascone Is New NIDDK Deputy Executive Officer

Lisa Mascone was recently named deputy executive officer for NIDDK. She will be responsible for working with the associate director for management to advise NIDDK senior officials on all phases of administrative management.



“Ms. Mascone is an experienced administrator, manager and supervisor,” said NIDDK associate director for management Dr. Lucy Greene, who made the appointment. “Her wide range of NIH administrative experience and knowledge of the NIH policies and processes makes her an ideal candidate and an asset to the NIDDK.”

Prior to joining NIDDK, Mascone worked at the National Cancer Institute as an administrative resource center manager for 8 years, providing administrative oversight to the office of the director programs. She also served as administrative officer for 10 years in the intramural division of NIAID. She earned a bachelor’s degree in multiple areas of discipline from the University of Maryland.



Someone in the U.S. goes into cardiac arrest every 2 to 3 minutes, and three out of four cases take place at home. The important message from a new study supported by NHLBI is that in these situations, every second counts.

### Quick Action for Cardiac Arrest

According to an NHLBI-supported study, automated external defibrillators (AEDs) and cardiopulmonary resuscitation (CPR) are equally helpful for sudden cardiac arrest in the home. This first study to explore AEDs also found that the devices are underused. Researchers, whose findings will be published online and in the Apr. 24 print edition of the *New England Journal of Medicine*, said the important message here is that whatever quick action you take—using an AED, performing CPR and, in all cases, calling 911—every second counts. Someone in the U.S. goes into cardiac arrest every 2 to 3 minutes, and three out of four cases take place at home. Being prepared in these situations can help save lives.

### New Findings—and a Surprising Link—for Type 2 Diabetes

An international team that included NHGRI scientists has identified six more genetic variants involved in type 2 diabetes, raising to 16 the total number of genetic risk factors associated with increased risk of the disease. The biggest surprises in the findings? First, none of the genetic variants uncovered in the new study had been suspected of playing a role in type 2 diabetes; plus, the new variant most strongly associated with the disease has also been implicated in prostate cancer. The study, published online in *Nature Genetics* on Mar. 31, combined genetic data from more than 70,000 people and was carried out by more than 90 scientists in Europe and North America. Diabetes, a major cause of heart disease and stroke in U.S. adults, is a common cause of blindness, kidney failure and amputations not related to trauma. Researchers said the discovery of these new variants could aid in the understanding of environmental influences and in the development of new, more precisely targeted therapeutics for the disease. The work could also have an important role in understanding the link between type 2 diabetes and prostate cancer, affecting the future design of drugs for both conditions.

### ADHD, Stimulants and Substance Abuse

Is there a link between stimulant medications for young people with attention deficit hyperactivity disorder (ADHD) and substance abuse lat-

er in life? This question has been widely debated. Now, two studies funded by NIDA, NIMH and NICHD and published in the April issue of the *American Journal of Psychiatry*, suggest that treating children as young as 6 or 7 with stimulants for ADHD is not likely to increase their risk for substance abuse as adults, though the studies showed treatment with stimulants didn't prevent substance abuse either. This kind of study is important because stimulants are often prescribed and, like drugs of abuse, they increase dopamine concentrations in the brain and can themselves be abused. Some research has also shown that the earlier an individual is exposed to drugs with abuse potential, the greater his or her risk of substance abuse as an adult. Studies like this could help the medical community provide scientifically valid information to clinicians and parents, though scientists also see a need for more studies and to continue to screen young people with ADHD for substance abuse. ADHD is the most commonly diagnosed behavioral disorder in children and adolescents in this country.

### The Importance of Older Eyes

Donors of up to 75 years of age should be included in the age pool for cornea transplants, according to an NEI-funded study, because transplants using tissue from older and younger donors have similar rates of survival. In fact, the study, published in the April issue of *Ophthalmology*, showed that the 5-year transplant success rate was the same—86 percent—for transplants performed with corneas from donors ages 12 to 65 and donors ages 66 to 75. This news comes at a good time. Though the availability of donor corneas has been adequate in the U.S. for the last 10 years, the study authors said recent changes in Food and Drug Administration regulations will likely cause a decrease in the supply of donated corneas in coming years. The cornea—the clear, dome-shaped surface that covers the front of the eye—offers protection and helps focus light entering the eye.—compiled by Sarah Schmelling



The phone numbers for more information about the studies below are 1-866-444-2214 (TTY 1-866-411-1010) unless otherwise noted.

### Study of Fibroids Needs Women

Women ages 33-50 suffering with fibroids are invited to participate in an NIH study. Compensation is provided. Refer to study 06-CH-0090.

### Dry Mouth

Do you have dry mouth after radiation therapy for head and neck cancer? Are you currently cancer-free? If so, you may be eligible to participate in a clinical research study that will test a new gene therapy to try to increase saliva production. All study-related tests and medications are provided at no cost.

### Kidney Disease

Do you have diabetes and early kidney disease (microalbuminuria)? If so, you may be eligible to participate in a research study to try and identify biomarkers that may lead to better treatments. All study-related tests and medications are provided at no cost. Study is for patients 18 or older.

### Coronary Artery Disease

Have you had a heart attack, angioplasty or bypass surgery? If so, you may be eligible to participate in a clinical research study that will test an investigational medication that may lower C-reactive protein. C-reactive protein may indicate that you are at risk for sudden heart problems such as a heart attack. All study-related tests and medications are provided at no cost. Compensation is provided.

### Asthma Study Is Recruiting

Patients with asthma who are taking inhaled steroids may be eligible to participate in a research study at NIH. There is no cost for study-related tests or medicines. The study will see if a medicine that is used widely for diabetes can improve asthma. Compensation is provided.

### Blood Count Study Needs African Americans

Healthy African Americans or Africans 18 years and older are needed for blood count study. Compensation is available.

### One-Day Outpatient Study

Healthy volunteers, ages 19 to 55, are needed to participate in research studying genes and brain function. Testing procedures involve a blood draw, non-invasive neuroimaging, interviews and cognitive testing. No overnight stay. No medication trial. Compensation is provided. Call the Clinical Brain Disorders Branch at (301) 435-8970 or email [Danielef@mail.nih.gov](mailto:Danielef@mail.nih.gov). Refer to protocol 95-M-0150.

### Anthrax Vaccine Study

NICHD is seeking healthy volunteers 18-45 years of age to participate in an investigational anthrax vaccine study (04-CH-0283) conducted at the Clinical Center. Medical screening will determine eligibility. Compensation will be provided. Call 1-800-411-1222 (TTY 1-866-411-1010).

### Rudolph Heads New CSR Review Group

Dr. Joseph Rudolph has been named chief of the new emerging technologies and training in neurosciences (ETTN) integrated review group at the Center for Scientific Review.



“Dr. Rudolph is a dynamic leader and innovator who has shown a strong commitment to both science and peer review,” said CSR director Dr. Toni Scarpa. “He’s just the person to lead the development of our new neuroscience review group.”

The new IRG resulted from a reclustering of CSR’s neuroscience study sections to improve the quality and efficiency of reviews. ETTN includes two study sections as well as special emphasis panels to review fellowship and small business grant applications for all the neurosciences.

The two ETTN study sections are new ones recommended by the NIH peer review advisory committee and others: molecular neurogenetics study section and neurotechnology study section.

Rudolph previously was scientific review officer for CSR’s neurotoxicology and alcohol study section. He has also helped lead CSR efforts to implement asynchronous electronic discussion reviews, which are enabling CSR to recruit experienced reviewers who find it difficult or impossible to travel to regular review meetings.

Rudolph earned his Ph.D. in pharmacology from the University of Florida, where he studied the effects of chronic ethanol exposure on NMDA receptor pharmacology and physiology. He first came to the NIH intramural program as a postdoctoral fellow, studying the genetics of alcoholism and other disorders in NIAAA’s Laboratory of Neurogenetics. Before coming to CSR, he was group leader of the applied genomics and molecular genetics core facility at Transgenomic, Inc., in Gaithersburg.

**R&W Provides Circus Experience for Thousands**

PHOTOS: ERNIE BRANSON

More than 10,000 tickets were provided by the R&W at NIH for its 11th annual Premiere Night with Ringling Bros. and Barnum & Bailey Circus on Mar. 26. In a partnership with Easter Seals of the Washington metropolitan area, R&W donated more than 4,000 tickets to patients and families of the Clinical Center as well as such charitable groups as Children's National Medical Center, Bethesda Cares, Arc of Montgomery County, St. Ann's Infant and Maternity Home and soldiers and their families from Walter Reed Army Medical Center.

Before the trip downtown to the Verizon Center for the circus performance, R&W also arranged for several circus clowns to visit the Clinical Center. Since premiere night was launched, more than 50,000 people have been treated to a night at the circus.



**Top:**

At the Clinical Center, Loran Williams enjoys a Mar. 26 pre-performance visit by clowns Howard Griffith (c) and Dustin Portillo from Ringling Bros. and Barnum & Bailey Circus.

**Middle:**

At left, Williams goes nose to nose with Griffith. At right, Abubakar Dar entertains the two jokesters.

**Bottom:**

**Walk a mile in these?** Sharlotte Hamilton-Hunt trades slippers for clown shoes. At right, NCI's Larry Chloupek (back, l) and his family don "Bellobration" wigs à la Bello the Clown during R&W Night at the Circus, which was held at the Verizon Center.