



*June 2007*



## NIEHS Spotlight

- [Fellows Network at NIEHS Biomedical Career Fair](#)
- [Employee Input Dooms Proposed Canada Geese Study](#)
- [Olden Speaks to NCSU Grads](#)
- [Olden and Patterson Recognized for 9/11 and Katrina Response](#)
- [NIEHS Observes Asian Pacific Islander Month](#)
- [Library Holds Open House and InfoFest](#)
- [Shropshire Recognized for Volunteer Work](#)
- [Former NIEHS Scientist Honored](#)



## Science Notebook

- [NTP Makes News with Report on Hexavalent Chromium](#)
- [Distinguished Lecturer Reports on Coactivator Research](#)
- [TGen President Outlines System Medicine Approach](#)
- [Duke Researcher Discusses Models of Neurodegenerative Diseases](#)
- [Lineberger Symposium Highlights Virus and Immunity in Cancer](#)
- [Intramural Research Accomplishments 2006](#)
- [Extramural Update](#)
- [DERT Papers of the Month](#)
  - [Inhibition of RelB Synthesis by ER \$\alpha\$  Signaling Controls the Shift in Breast Cancer Cell Phenotypes](#)
  - [Riboflavin Activated by UV Exposure Causes Oxidative DNA Damage, Which Is Inhibited by Vitamin C](#)
  - [Autism Disorder Risk Increased in Babies of Mothers with Glutathione S-Transferase P1 Haplotype](#)
  - [Radiation-Induced Male Sterility Is due to Damage in the Somatic Testicular Cells and not the Spermatogonia](#)
- [DIR Papers of the Month](#)
  - [Defects in mtDNA Replication Linked to Cardiac Dysfunction](#)
  - [Advances in Detection of Pre-Invasive Lung Cancer in LIFE Study](#)
  - [Role of Retinoid-Related Orphan Receptor  \$\gamma\$  in Inflammatory Disease](#)



## Inside the Institute

- [Institute Shows Off Its “Green” Side on Earth Day 2007](#)
- [Take Your Child to Work Day](#)
- [NIEHS Health and Fitness Week Promotes Healthy Lifestyles](#)
- [Imperial Center Live at Lunch](#)
- [Employee’s Daughter Honored by Girl Scouts](#)
- [Calendar of Upcoming Events](#)



# NIEHS Spotlight

## Fellows Network at NIEHS Biomedical Career Fair

*By Eddy Ball*

The NIEHS Trainees Assembly (NTA) held the tenth annual [NIEHS Biomedical Career Fair](#) on April 27 at the RTP Headquarters of the Environmental Protection Agency (EPA). The all-day event attracted over 300 non-tenured, non-permanent scientists in training at NIEHS, EPA and several universities in the Carolinas. The NIEHS Office of the Scientific Director (OSD) was a major sponsor of the Career Fair, which featured a keynote address, company and organization exhibits, a networking luncheon and panel discussion sessions on public- and private-sector employment opportunities.

The annual Career Fair is a valuable service for pre- and postdoctoral fellows because it fills a void in most training programs, according to Friederike L. Jayes, D.V.M., Ph.D., chairperson of the 2007 NIEHS Career Fair Committee. Nationwide, only between 20 and 30 percent of postdocs end up in tenure-track academic careers, which is where most of the emphasis in their training is placed.

“We get a lot of technical and scientific training in the labs at NIEHS,” Jayes said, “but in order to land a job [in today’s market], we really need to improve on a lot of other skills and techniques as well.... It really hampers people trying to be competitive out in the field because they don’t know what they want or how to prepare for it.” The Career Fair helps to bridge this gap by exposing trainees to people working in different scientific careers — and by showcasing emerging occupations, such as medical science liaison.

Although some companies may have been recruiting at the event, Jayes emphasized that “this was not a job fair.” Instead, the Career Fair focused on networking interactions for young scientists. Trainees had an opportunity to meet people from companies that have other than tenure-track jobs and gather information on the many different opportunities for scientists.

### Panel Discussions

In planning for the Career Fair, the NTA Organizing Committee picked nine areas for small-group panel discussions. Each panel included three to five specialists working in the area under discussion along with an organizing committee member moderator from either NIEHS or EPA. Trainees had the opportunity to sit in on at least three sessions, as well as speak individually with industry representatives at display booths. Panel Discussion sessions this year focused on the following areas:

- Medical Science Liaison
- Consulting
- Medical and Science Writing
- Contract Research Organizations
- Government Agencies
- Industry – Applications Focus
- Teaching Careers
- Clinical Research
- Industry – Small/Start-Up Companies

### Networking Luncheon

During lunch, attendees had the opportunity to sit at one of 42 tables, each with one panelist or speaker and seven trainees. There attendees could engage in small group discussions in an informal setting and ask panelists more about their work.

### The Role of the NTA at NIEHS

The NTA is a liaison between trainees and the institute. It works closely with the [NIEHS Office of Fellows Career Development](#) and sponsors several social and career events each year, trying to give trainees a sense of community and identity within the Institute.

The NTA maintains a [website](#) with event schedules, helpful information about working as a trainee and links to resources for fellows. The group also co-sponsors an [RTP Postdocs Blog](#) and offers a [listserv](#) where NIEHS trainees are can register with the group and join a mailing list.

Throughout the day, trainees could ask people about how they prepared for the jobs they hold, what the jobs are like, what other skills and backgrounds are required, and, finally, what companies are looking for in applicants. “Since there are usually four panelists in each session, people get different points of view.” Jayes explained. “Trainees also form networking connections during the Career Fair, which is something they can build on.”

The Fair opened with a talk by Middle Tennessee State University Chemistry Professor Preston J. MacDougall, Ph.D. His keynote address, titled “Communicating Science: Can You Hear Me Now?” set the tone for the day. MacDougall underscored the importance for scientists to develop a facility for communicating what they do to non-scientists among the general public and in the organizations where they work. Young scientists, MacDougall said, need to develop as well the same kind of flexibility every worker needs in the years to come and learn to adapt to an evolving economy.

In addition to funding by NIEHS OSD, the Career Fair was made possible by support at the Event Sponsor level by the NTA, EPA and National Postdoctoral Association. Several biomedical firms and non-profit organizations also helped sponsor the event at the Gold, Silver and Bronze levels.

Trainees interested in volunteering to plan next year’s Career Fair can contact the NTA [by e-mail](#).



Professor and radio commentator Preston MacDougall used humor to get his message about communication skills across. (Photo courtesy of Steve McCaw)



Representatives of biomedical organizations, such as Bob Miles of RTI, were on hand to answer questions and offer guidance for trainees curious about non-tenure track careers. (Photo courtesy of Steve McCaw)



Fayetteville State University Provost and Vice Chancellor Juliette Bell, Ph.D. (left), and N. C. Central University Professor Seronda Jackson, Ph.D., joined panelists representing St. Augustine’s College, Greenville Technical College and N. C. State University in the Teaching Careers Panel Discussion. (Photo courtesy of Steve McCaw)



Fred Smith, M.D. (left), of the two-person consulting group PharmSupport told trainees of lessons he learned on the front lines as a consultant. His partner at PharmSupport, Chandra Louise, Ph.D. (right), Duke University’s Karthik Gopalakrishnan, Ph.D. (center), and Sanford Garner, Ph.D. (behind Smith), of Constella Group also shared their insights with trainees. (Photo courtesy of Steve McCaw)



*Terry Green, Ph.D., moderated the Industry – Applications Focus Panel Discussion. Trainees heard from representatives of Clontech Laboratories, Colgate Palmolive, Johnson & Johnson Pharmaceutical Research and Development, and BioServe Biotechnologies. (Photo courtesy of Steve McCaw)*



*Pramila Singh, Ph.D., D.A.B.T. is a former EPA postdoctoral fellow who now works for PPD, Inc. (Pharmaceutical Product Development, Inc.). She participated as a panelist on the Contract Research Organization panel. (Photo courtesy of Steve McCaw)*



*Thanks to Jane Chin, Ph.D., of MSL Institute and Gus Khursigara, Ph.D., of Alexion Pharmaceuticals, trainees became more aware of opportunities in the field of medical science liaison. Chandra Coleman, Ph.D., of Allergan Medical Affairs and Heather L. Vita, Ph.D., of UCB were also members of the Medical Science Liaison Panel. (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

# Employee Input Dooms Proposed Canada Geese Study

By Eddy Ball

Comments by employees have convinced NIEHS management to turn down a Canada Geese study on campus proposed by North Carolina State University (NCSSU) Fisheries and Wildlife Sciences researchers. The comments, presented to NIEHS Associate Director for Management Marc Hollander, were in response to an information session about the proposed study presented by Professor Christopher S. DePerno, Ph.D., and Graduate Student Chris Ayers on April 26 in Rodbell Auditorium.

In addition to studying the behavior of Canada Geese, DePerno and Ayers proposed testing the efficacy of the Environmental Protection Agency (EPA)-approved repellent Flight Control Plus<sup>®</sup>. They were seeking to include the NIEHS campus as one of six study sites in the Triangle where researchers would apply the repellent to the birds' food source and study the effects of different mowing schedules on feeding patterns.

DePerno opened the session with a familiar tale of an environmental success story soured by the unanticipated overpopulation of a species once endangered by "unrestricted harvest." Today an estimated 600,000 resident, non-migrating Canada Geese thrive along the east coast of the United States. As a result of what DePerno called a "management success," in some places the population and its impact on humans increase by ten percent each year.

One resident goose can defecate up to 30 times a day, leaving behind one to two pounds of feces for the average three to four pounds of grass it eats every 24 hours.



Chris DePerno, left, fielded questions as Julius Thigpen looked on. (Photo courtesy of Steve McCaw)

## 9,10-anthraquinone — A Tale of Two Agencies

Arkion Life Sciences and distributor [SePRO Corporation](#) describe Flight Control Plus<sup>®</sup> as an "effective and humane (non-lethal) Canada Goose repellent." The repellent works by causing "temporary but very effective digestive irritation" in geese. Because it leaves a distinctive "Visual Warning" that the birds recognize when viewed in the ultraviolet light spectrum, geese soon associate the sight of treated grass with the digestive irritation and have no choice but to seek an alternative food source. SePro claims that the repellent won't wash or rub off treated grass, making it persistent and safe for humans.

In December 1998, the EPA issued its [Fact Sheet](#) in response to a request for approval for non-food use as a repellent for the product Flight Control Plus<sup>®</sup> from Environmental Biocontrol, International. Based on studies submitted by the company, EPA found no reason for concern regarding occupational, school and day care exposures. "The information submitted in support of the application for registration of anthraquinone," the agency concluded, "adequately satisfies the requirements set forth in 40 CFR 158.690 (c) for biochemical pesticides for nonfood outdoor uses. The overall toxicological risk from human exposure to anthraquinone is considered negligible."

In 2004, however, NTP toxicity testing on rodents told another story in a report by scientists at the Batelle Columbus Laboratory. [NTP Technical Report 494](#) raised concerns about clear evidence of liver carcinogenicity in rodents consuming dosed feed containing the compound. The report also found non-neoplastic lesions in other organs and suspected involvement in the endocrine system.

The waste, which can contain zoonotic pathogens and parasites, such as *Giardia*, creates a potential health concern wherever children play. The fertilizer-rich feces can also contaminate waterways and turn walkways into safety hazards.

The animals are aggressive in defense of their young and willingly take on humans perceived as threatening their nests — whether on suburban lawns, athletic fields and golf courses or at offices, parks and institutions. When geese find a friendly habitat, such as the many lawns, ponds and lakes in the Triangle, they tend to abandon their annual migrations. As non-migratory birds, they can live as long as 25 years. With each couple producing 5 to 12 eggs each year, the problem can only worsen over time.

DePerno and Ayers represented the repellent as species-specific, humane, safe and non-toxic — and far more effective than dogs, fencing or alarming noises for deterring the geese. They also maintained that the study's goal is to get much needed information about the geese and not necessarily to support a specific strategy for dealing with the unwanted visitors. "These wildlife issues can be very contentious, but we're researchers," DePerno explained. "I'm neither for geese nor against them."



Several attendees, such as Biologist Colleen Anna (pictured here), were skeptical about the need for and safety of the NCSU project. Biologist Maggie Humble, who deals with resident geese at her Durham home, questioned the effect of the repellent on other birds. "What will it do to the cardinals?" she asked. (Photo courtesy of Steve McCaw)



Chris Ayers described how he would measure geese response to repellent-laced grass. The study also planned to quantify the effects of repellent and mowing patterns on feeding, as well as look at fecal mass, seed germination ability, pathogen content, and nitrogen and phosphorus content. (Photo courtesy of Steve McCaw)

Meeting facilitator Microbiologist Julius Thigpen, Ph.D., joined DePerno in the question and answer portion of the session. Several people in the audience wanted to know more about the possible effects of consumption of the repellent by children and pets. National Toxicology Program (NTP) Investigator David Malarkey, D.V.M., Ph.D., noted that "the geese are not really a problem on our campus." Malarkey also questioned whether the active ingredient of the repellent, 9,10-anthraquinone, is really as safe as the manufacturer claimed. He added that NTP studies of the compound had found evidence of its carcinogenic potential.

"I decided against the study based on the comments I received," Hollander said after rejecting the proposal. He described the information session as part of a strategy to increase stakeholder participation in decision making that includes reviving the Environmental Awareness Advisory Committee.

[Return to Table of Contents](#)

# Olden Speaks to NCSU Grads

By Eddy Ball

In his commencement address on May 12 at Raleigh's RBC Center, Director Emeritus Ken Olden, Ph.D., encouraged recipients of over 4,000 North Carolina State University (NCSU) degrees to pursue collaborative partnerships as they "reach out to others in your community and around the globe." In recognition of his accomplishments as a scientist and leader, Olden received an honorary Doctor of Sciences degree from the University.

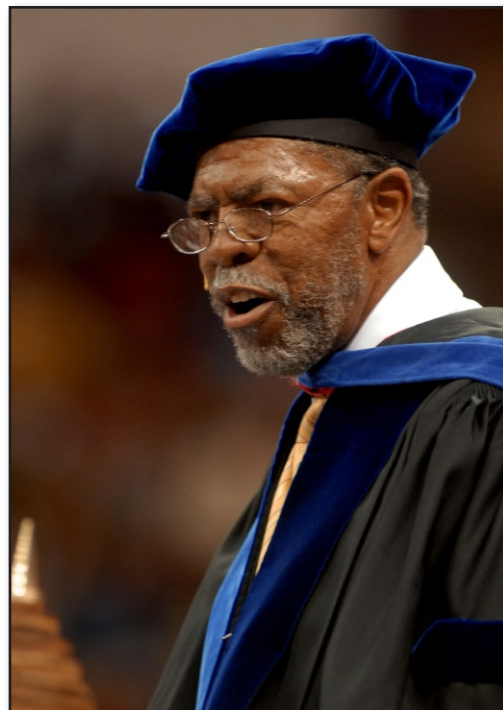
"Success is almost always a collaborative effort," Olden observed as he attributed much of his success as NIEHS and National Toxicology Program Director from 1991 to 2005 to the "collaborative leadership, strategic partnerships and team work" he fostered during his tenure. He also underscored the importance of promoting inclusiveness and encouraging people with an interest in an issue to participate in "coalitions or alliances so that all stakeholders can be winners."

Olden, who now serves as chief of the Metastasis Section at NIEHS, observed that most academic training — his own, as well as his audience's — does not prepare students for the "relationship building and relationship management... [that] prove to be just as important as disciplinary competence." He then offered examples of pivotal times when such skills made the difference between success and failure.

The successes of the new coalition government in Northern Ireland and the creation of the Research Triangle Park, he explained, reflected the "ability [of individuals in coalitions] to set aside narrow self-interests to achieve the broader goal." In contrast, the Clinton Administration healthcare reform effort was rejected by the American people, he said, because it was developed "without input from important stakeholders and ordinary citizens."

Among other pressing developments, Olden pointed to the issues of globalization and energy use as complex and systemic problems the new graduates will face in their professional lives. "Many of the challenges that we now face as a society cannot be solved without partners," he maintained. "Human progress is inherently a cooperative enterprise."

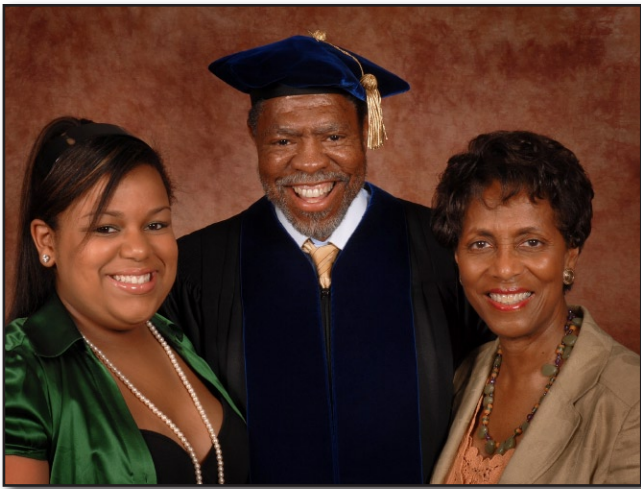
After challenging the graduates to advance a shared agenda, Olden closed by wishing his audience peace of mind, a strong and loving family, caring friends and the satisfaction of accomplishing something important.



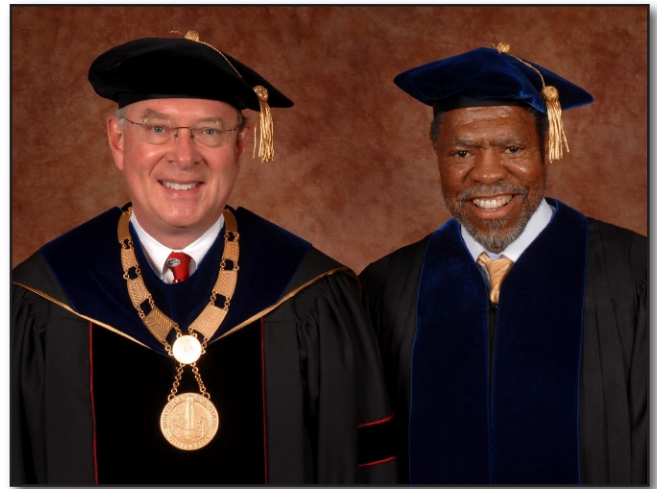
*Wearing the hood symbolizing his honorary degree, Olden compared human social organizations to the body. "While each cell in the body has its own identity, individual cells function in concert with trillions of other cells as part of a complex organism." (Photo courtesy of Roger Winstead, director of photography at NCSU)*



*On the stage with Olden were officials of the university and two other recipients of honorary degrees, architect Eduardo Catalano and businessman Roger Milliken. (Photo courtesy of Roger Winstead, director of photography at NCSU)*



*Prior to the ceremony, Olden posed with his daughter Heather (left), a student at Hampton University, and his wife Sandie White, Ph.D., director of the Center For Science, Math and Technology Education at N. C. Central University. (Photo courtesy of Roger Winstead, director of photography at NCSU)*



*NCSU Chancellor James Oblinger, Ph.D., presented Olden with an honorary Doctor of Science degree just before his address to the class of 2007. (Photo courtesy of Roger Winstead, director of photography at NCSU)*

[Return to Table of Contents](#)

## **Olden and Patterson Recognized for 9/11 and Katrina Response**

*By Eddy Ball*

It came as a complete surprise to Ken Olden, Ph.D., and James Patterson on April 23 when colleagues called them in for an unscheduled Monday morning meeting in the main conference room at Nottingham Hall. However, when a smiling Chip Hughes took the floor, it soon became clear to the unsuspecting honorees that the gathering was anything but routine.

Hughes, the director of the DERT Worker Education and Training Program (WETB), had brought special medallions to present to his friends and colleagues in recognition of their exceptional efforts in the aftermath of America's greatest disasters in the twenty-first century.

“There are two people we wanted to honor who weren’t able to be at our New York ceremony [recognizing contributors to the Institute’s 9/11 response on the fifth anniversary last September],” he said. “In both cases, James and Ken, you guys really came through for us at certain important times.”

Olden, as director, had spearheaded NIEHS Disaster Response Training efforts in the days following the World Trade Center bombing. In 2005, as a principal investigator and director emeritus, Olden had also provided leadership in the Institute’s efforts to help victims of Hurricanes Katrina and Rita overseen by Director David A. Schwartz, M.D..



*Cast in bronze, the medallion features “the original images, the ones that we know so well, the flag over the World Trade Center... and workers in Katrina taking a break from the clean-up in the back,” Hughes told the audience. (Photo courtesy of Steve McCaw)*





*Looking reticent, James Patterson, left, watched as an uncharacteristically solemn Chip Hughes congratulated Ken Olden. (Photo courtesy of Steve McCaw)*



*Looking more like themselves, Patterson and Hughes shared a laugh as they recalled the hectic days after 9/11 when both worked around the usual obstacles to get funds in place. (Photo courtesy of Steve McCaw)*

Unlike Olden, Patterson, an Office of Acquisitions contract specialist, performed his part behind the scenes, expediting requests for purchases and expenditures. Because of his efforts and the efforts of his colleagues in Acquisitions, NIEHS moved with unprecedented speed to recruit, train and supply the men and women who helped to contain the environmental damage resulting from both disasters.

The need for help after 9/11 came, Hughes noted, almost literally “at the last minute of the fiscal year.” With Olden’s help, the WETP request for \$12 million bypassed layers of approval to go straight to the Secretary of State’s Office. “We had done some supplemental something or the other,” Hughes recalled. “And we just need[ed] to do this thing right now.” Once funding was approved, Patterson and his colleagues made sure money and supplies fell into place as quickly as possible.

“We don’t ever get to say ‘thank you’ enough,” Hughes reflected. Not surprisingly, Olden played down his own role and pointed to the importance of collaborative leadership. “It’s not one person or two people,” he told the group. “It’s a community effort.” Likewise, Patterson turned his time in the limelight into an opportunity for thanking his colleagues in Acquisitions for their work making the Disaster Response Training a success.

[\*Return to Table of Contents\*](#)

# NIEHS Observes Asian Pacific Islander Month

By Eddy Ball

A small, but enthusiastic group of employees and contractors attended a presentation on May 22 in Rodbell Auditorium to recognize the contributions of Asians and Pacific Islanders to American culture. The NIEHS Diversity Council-sponsored event featured a talk by Eusabio “Bing” Inocencio, Ph.D., followed by Asian food and music in the NIEHS cafeteria.

A Philippine-born economist, human relations specialist and former university president, Inocencio is founder and president of SpeakersOnAsianTopics.Org. His talk was hosted by Alyce Bradbury and titled “As American as Apple Pie, Adobo, Chapti, Dim Sum, Kim Chee, Pho and Sushi; Or, Working through the Smorgasbord of Prejudice and Discrimination.” Inocencio used the “smorgasbord” metaphor throughout his presentation to illustrate the way that America has evolved from being a “melting pot” to a truly multicultural society.

Observing that “the past is persistent,” Inocencio began his presentation with an historical review of the Asian experience in the United States beginning with the massive immigration of Chinese laborers during the California Gold Rush — and America’s shifting attitudes towards the new residents.

Inocencio then moved on to the prejudice, ignorance and often hate that persist to this day among many non-Asians. Citing a 2001 Yankelovich poll, he noted that 24% of respondents considered Asian-Americans an economic threat, and one-third of respondents questioned their loyalty.

On the upside, Inocencio noted, are several positive beliefs about Asians that in fact coincide with some of the strong currents common in Asian cultural values, such as strong family values and the high value placed on education and enlightenment. Asians have also maintained their deep respect for elders, “face” and honor, and harmony. Increasingly, Inocencio added, today’s Asians have come to consider themselves “Americans by choice, and Asians by culture.”

Among the many positive things other Americans can learn from their brothers and sisters of Asian descent, Inocencio concluded, is the culture’s perspective about time. Traditionally, as illustrated by a quote from the Taoist philosopher Lao Tsu, Asians have seen themselves as a part of history and understood their responsibility to future generations.



*Inocencio used the image of an iceberg as he moved from his discussion of the obvious signs of Asian identity to an account of the culture’s deeply ingrained basic values. (Photo courtesy of Steve McCaw)*



*Inocencio illustrated the Asian cultural emphasis on harmony with an incident from his own life. Asked by tall colleague how he felt about being so short, instead of reacting angrily, the speaker relied on his wit and good sense of timing when he replied, “Like a dime among nickels.” (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

# Library Holds Open House and InfoFest

By Eddy Ball

For the NIEHS scientists who took advantage of the NIEHS Library's Open House and InfoFest on May 24, the time was well spent. Representatives from Web of Knowledge, Scopus, ExPub, and Quosa were there to give hands-on demonstrations on how to more effectively retrieve relevant and comprehensive literature search results. The Library also demonstrated its new NIEHS AllSearch tool, which allows users to search across multiple databases at one time.

On-hand to answer questions were Librarian and Information Services Chief Dav Robertson, M.S.L.S., and Biomedical Science Librarians Stephanie Holmgren, M.S.L.S., and Larry Wright, M.S.L.S., Ph.D. The library was also showcasing a National Library of Medicine (NLM) poster display of [Medieval Medical Manuscripts](#) and a display commemorating the centennial anniversary of the birth of author Rachel Carson. Carson's 1962 book *Silent Spring* is widely credited with energizing the nascent environmental movement of the 1950s.

The event also gave employees an opportunity to see firsthand how the conventional library, a repository of hard copies of books and periodicals, is evolving into what Robertson describes as a [knowledge center](#). "In light of the Internet revolution, we're making the library more relevant to the information needs of today's--and tomorrow's--scientists," Robertson observed. "We're following the New Vision we announced last fall as we implement three initiatives: moving even further towards a digital library, embedding our reference professionals with research and clinical teams, and developing consultation expertise in bioinformatics."



Ewa Marczak, Ph.D., learned about the ways Scopus could facilitate the literature searches she needs to perform in her work with the Medicinal Chemistry Group. (Photo courtesy of Steve McCaw)



Unlike the stereotypical libraries of the past, Knowledge Centers are places where people can talk — and even laugh. In this photo, IRTA Fellow Huiming Gao, Ph.D., enjoys a vendor's anecdote. (Photo courtesy of Steve McCaw)



Pathologist Ron Herbert, D.V.M., Ph.D., checked out Web of Science. In his work with National Toxicology Program Technical Reports, Herbert needs to perform exhaustive searches of previous studies of nominated compounds. (Photo courtesy of Steve McCaw)



*The library took advantage of space made available by its new mobile shelving system to display the NLM Medieval Manuscript Display, which made its first stop at a library outside Bethesda here at NIEHS. (Photo by Eddy Ball)*

[Return to Table of Contents](#)



*Patron Alicia Moore (left), a biologist in the Laboratory of Experimental Pathology posed with Employee Services Manager Dona McNeill and Robertson. The NIEHS Library prides itself on its accessibility, and Robertson had invited Moore and McNeill, members of the Disability Advocacy Committee, to distribute a survey at the Open House soliciting suggestions about any necessary improvements. (Photo courtesy of Steve McCaw)*

# Shropshire Recognized for Volunteer Work

By Eddy Ball

On April 19, UNC Hospitals presented Industrial Hygienist Valeria (Vee Vee) Shropshire the Elaine M. Hill Award for Distinguished Volunteer Service. Shropshire, who is a member of the Health and Safety Branch team at NIEHS, has spent her Friday evenings — and many Saturday mornings — in recreational therapy with patients in the Pediatric Play Atrium for over 25 years.

Vee Vee’s colleagues in the Therapeutic Recreation Program nominated her for the honor. They praised her commitment to the program, her ability to build strong and beneficial relationships with the children and her exemplary professionalism. “Week, after week, after week, Vee Vee demonstrates unwavering intent to make a positive impact in the hospital setting,” wrote Therapeutic Recreational Specialist Becky White. “She has been there for the children on holidays and in inclement weather to make sure the needs of the patients and families are provided for.”

When asked about her accomplishments, Shropshire responded in her typically low-key way that “it’s just the right thing to do.” However, her supervisor at the hospital saw things a little differently. “Vee Vee



*Shropshire’s winning smile and sincere interest in others have endeared her to children of all ages. (Photo courtesy of Steve McCaw)*

## Elaine Hill – An Inspiration for Healthcare

Elaine M. Hill was a UNC Hospitals volunteer from the day the doors were opened in September, 1952 until she became the Director of Volunteer Services in 1967. Shropshire worked with Hill until her retirement in 1990. Eric Munson, President Emeritus of UNC Hospitals, said of Hill, “She was the moral compass or conscience of the institution. She was the self-appointed guardian, the soul of the place.”

Hill had a knack for knowing what patients and their families needed and then developing the programs and finding the volunteers to meet the demand. Examples of these programs are the pediatric playroom which led to the establishment of the Department of Recreation Therapy, the patient relations program, the personal emergency response system (Lifeline and now Health Watch), the Junior Volunteer program and the interpreter service.

In recognition of her leadership, the UNC Hospitals Board of Directors in 1990 named the annual distinguished volunteer award in her honor.

Shropshire has been the most energetic, committed, consistently compassionate volunteer that I have encountered with the UNC Hospitals program,” commented Laurie Reddick, director of Recreational Therapy.

Shropshire had not expected the award and nearly missed the banquet where she was to be honored. For her, the kids are the important thing. She plans to go to work again this Friday night — just as she has like clockwork ever since she began volunteering in 1981 as a UNC graduate student.

[Return to Table of Contents](#)

# Former NIEHS Scientist Honored

*By Eddy Ball*

Charles (Chuck) H. Langley, Ph.D., left NIEHS nearly 20 years ago to pursue his research interests in population genetics and molecular evolution in the College of Biological Sciences at the University of California – Davis. On April 30, the prestigious American Academy of Arts and Sciences (AAAS) announced that Langley was one of 203 new fellows from throughout the world elected to the Academy this year.

In its announcement, the Academy noted that the class of 2007 included former Vice President of the United States Al Gore, former Associate Justice of the United States Supreme Court Sandra Day O’Conner, New York Mayor Michael Bloomberg, winners of Nobel and Academy Awards and the Pulitzer Prize, corporate CEOs and two former chairs of the President’s Council of Economic Advisors. Several artists also made the grade, including film maker Spike Lee and pianist Emmanuel Ax.

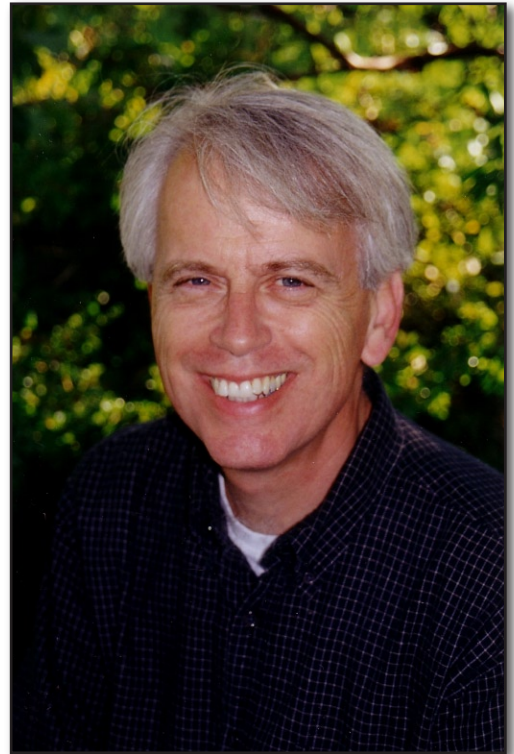
Since its founding in 1780 by John Adams, James Bowdoin, John Hancock and other scholar-patriots, AAAS has prided itself on electing the most prominent minds of the time to its membership. The membership has included such luminaries as George Washington, Daniel Webster, Albert Einstein and Winston Churchill. The organization currently counts more than 170 Nobel laureates and 50 Pulitzer Prize winners among its members.

Langley is a prolific researcher and a distinguished professor of genetics, evolution and ecology at Davis. He has garnered several additional honors since leaving the Institute, not the least of which was a Genetics Society of America (GSA) Medal in 1999. He was recognized by the GSA for his contributions to the understanding of genetic variation in natural populations.

In a January 2000 tribute to Langley on the occasion of his Genetics Society Award ([Genetics 154:3-4](#)), Jan Drake, Ph.D., chief of the Laboratory of Molecular Genetics, reflected on his unassuming friend’s significant scientific accomplishments, “impressive list of publications” and personal integrity. Langley was a principal investigator in what was then known as the Laboratory of Animal Genetics from 1973 to 1989.

Drake, who described himself as Langley’s “colleague and nominal chief” at NIEHS, recalled his friend’s leadership at a time when the genetics community at NIEHS was threatened by proposed organizational changes. “In this battle,” Drake wrote, “Chuck once again played a key role, taking over the formal leadership of the community for several months until the drama played out.” When the conflict was finally resolved — thanks in large part to Langley’s efforts — the genetics community emerged stronger than ever and continues to play an important role in the NIEHS research mission.

[Return to Table of Contents](#)



*Distinguished Professor Charles H. Langley  
(Photo courtesy of Stacia R. Langley,  
University of California - Davis)*



# Science Notebook

## NTP Makes News with Report on Hexavalent Chromium

By Eddy Ball and Robin Mackar

On May 16 and 17, a subcommittee of the Board of Scientific Counselors for the National Toxicology Program (NTP) met in Rodbell Auditorium to provide public peer review of several recently completed NTP study findings and conclusions. At the meeting, the Technical Reports Review Subcommittee approved reports on sodium dichromate dihydrate, which sparked interest in the national press, and six other compounds that have undergone two-year toxicology and carcinogenesis testing in rats and mice.

The report on sodium dichromate dihydrate in drinking water drew nationwide attention because the compound contains hexavalent chromium, which is also known as Cr (VI). *USA Today*, Bloomberg News and Reuters printed reports about the study after the NIEHS news release was distributed on May 16.

The dangers of Cr (VI) were brought to the public's attention by the \$330 million settlement in 1996 of a high-profile lawsuit on behalf of the people of Hinkley, Calif. against the Pacific Gas and Electric Company. The company had stored improperly waste water containing Cr (VI) that leached into ground water used a source of drinking water for the town's residents. In 2000, the film "Erin Brockovich," starring Julia Roberts, made the provocative crusader a household name and further raised public awareness of Cr (VI).

Sodium dichromate dihydrate is an inorganic compound containing Cr (VI) used in various industrial processes including electroplating operations, leather tanning and textile manufacturing. It is one of several compounds containing Cr (VI) that enter drinking water as a result of poor storage or improper disposal practices.

Although Cr (VI) is a known carcinogen when inhaled, there was little known about its effects when ingested orally. In a 1998 report, the Environmental Protection Agency determined that "No data were located in the available literature that suggested that it is carcinogenic by the oral route of exposure."

Eleven members of the California Congressional Delegation sent a letter to the NTP Director requesting that the NTP conduct the studies. Nominations for studying this compound also came from the California Environmental Protection Agency and the California Department of Health Services. The NTP began work on the compound after gaining input from the public and a panel of scientific experts about the study design.



Sodium Dichromate Dihydrate Study  
Scientist Michelle Hooth (Photo courtesy  
of Steve McCaw)



Sodium Dichromate Dihydrate Study  
Pathologist Ron Herbert (Photo courtesy  
of Steve McCaw)

Defenders of the safety of Cr (VI)-containing compounds had pointed to evidence that ingested Cr (VI) is reduced by a number of molecules, including ascorbate, glutathione and cysteine, in the acidic environment of the stomach and converted to Cr (III). Cr (III) is a harmless form of the element and an essential nutrient linked to healthy glucose metabolism. In addition to finding evidence of carcinogenic activity in the oral mucosa, however, the NTP investigators discovered increased incidences of neoplasms of the small intestine, indicating that the compound is not completely reduced in the stomach.

NTP toxicologist Michelle Hooth, Ph.D., was study scientist for the technical report and Ron Herbert, D.V.M., Ph.D., served as study pathologist. “Previous studies have shown that hexavalent chromium causes lung cancer in humans in certain occupational settings as a result of inhalation exposure,” Hooth explained. “We now know that it can also cause cancer in animals when administered orally.”



*Seated at the head of the Subcommittee table were, left to right, NTP Interim Associate Director Allen Dearry, Ph.D., Subcommittee Chair Nancy Kerkvliet, Ph.D., NIEHS Deputy Director Sam Wilson, M.D., and Chief, Toxicology Operations Branch, John Bucher, Ph.D. (Photo courtesy of Steve McCaw)*

## Technical Reports Reviewed

Although Cr (VI) received the most attention, the subcommittee approved with editorial changes Technical Reports on six other compounds that have shown toxicity and carcinogenesis in two-year studies.

- **Formamide (TR 541)** – Exposure by gavage, or forced feeding. Formamide was nominated for reproductive and genetic toxicity evaluation by the Environmental Defense Fund and for carcinogenicity evaluation by the National Cancer Institute because of the potential for human exposure associated with its widespread industrial use.
- **Ethinyl Estradiol – Multigenerational Study (TR 547)** – Exposure in feed. Ethinyl estradiol is a potent synthetic estrogen widely used in pharmaceutical preparations. It was selected by the NTP for inclusion in studies to examine endocrine disrupting compounds with estrogenic activity.
- **Ethinyl Estradiol – Bioassay (TR 548)** – Exposure in feed. Ethinyl estradiol was selected because of potential human developmental exposures resulting from unintentional continuation of the use of oral contraceptives containing ethinyl estradiol during early pregnancy.
- **Cumene (TR 542)** – Exposure by inhalation. Cumene occurs naturally in petroleum and in a variety of foodstuffs, as well as by a process utilizing acidic catalysts. Cumene was nominated for study by the NIEHS because of its high production volume, presence in gasoline and other fuels, potential for human exposure and the lack of existing carcinogenicity test data.
- **Cresols (TR 550)** – Exposure in feed. Cresols are high volume chemicals used in a wide variety of industrial and consumer products, including cleaners, petroleum additives and synthetic food flavors. They were nominated for study because of the potential for occupational and consumer exposure and the lack of chronic toxicity data.
- **Propargyl Alcohol (TR 552)** – Exposure by inhalation. Propargyl alcohol is used in the manufacture of chemicals and pharmaceuticals and in corrosion inhibition and solvent stabilization. It was nominated by the National Cancer Institute for study because of the potential for human exposure in occupational settings.



The Technical Reports Review Subcommittee voted unanimously to accept the conclusions of the draft NTP Technical Report 546 on sodium dichromate dihydrate with editorial amendment. All of the reports reviewed will now go to the full committee of the NTP Board of Scientific Counselors for approval at its June 22 meeting.



*Principal Reviewer Harish Sikka, Ph.D., of the State University of New York College at Buffalo, was impressed by evidence that sufficient Cr (VI) escaped breakdown in the stomach to cause neoplasms in the small intestines of test animals. (Photo courtesy of Steve McCaw)*



*Following each of their presentations, NTP investigators answered questions from their places at the table. Shown here are Formamide Study Scientist Richard Irwin, Ph.D. (Center), and David Malarkey, D.V.M., Ph.D. Malarkey was filling in for Study Pathologist Susan Elmore, D.V.M. (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

## Distinguished Lecturer Reports on Coactivator Research

*By Eddy Ball*

The 2006-2007 Distinguished Lecture Series concluded on May 22 in Rodbell Auditorium with a talk by Bert W. O'Malley, M.D. O'Malley is a professor and chairman of the Department of Molecular and Cellular Biology at the Baylor College of Medicine. His lecture was titled "The Expanding Roles of Nuclear Factor Coactivators."

When he introduced O'Malley as the final speaker in this year's lecture series, Host John Cidlowski, Ph.D., commented, "I think it's clear we've saved the best for last." Widely recognized as a pioneer in the field, O'Malley has studied steroid hormone action for over 30 years and published over 750 manuscripts. "In my opinion," Cidlowski continued, "he's probably done the most creative work of anyone in the field."

O'Malley had come to NIEHS to discuss his latest discoveries about the role of coactivators identified for nuclear receptors (NRs) in gene transcription.



*"If we want a new protein, we don't ever need a new gene. All we need is to add a new PTM [post-translational modification], and we have lots of enzymes to do that," O'Malley said about the flexibility of the coactivation process. (Photo courtesy of Steve McCaw)*

He said that nearly 300 coactivators and some 65 corepressors have been discovered so far in ongoing efforts to break the “coactivator code.”

NRs are transcription factors that play essential roles in a wide range of biological processes. These processes include the disrupted lipid and energy metabolism linked to development of the chronic conditions that plague increasing numbers of people, such as diabetes and obesity, as well as hormone-stimulated cancers of the breast, prostate and ovaries.

Coactivators contribute to the transcriptional process through enzymatic activities, such as acetylation, methylation, ubiquitination and phosphorylation, and through chromatin remodeling. In orderly cell regulation, coactivator complexes work in concert with corepressors to maintain a balance between transcription events, post-translational modifications and the disassembly of the complex.

These multiprotein complexes of activators and repressors define the type and extent of an organism’s response to NR molecular binding and whether specific genes are expressed as proteins. “There’s a sophisticated coding here,” O’Malley explained, “[that] determines the collection of proteins that will form the active complex in the nucleus.”

In the course of his talk, O’Malley concentrated primarily on a powerful cancer-promoting gene called steroid receptor coactivator (SRC)-3, which he described as “a master gene for cellular growth.” When SRC-3 is insufficiently balanced by levels of a little known protein called REG-gamma, SEC-3 promotes continuing cell replication. “Tumors love SRC-3,” he observed, “especially breast cancer... A tumor has a great advantage if it can increase the levels of this protein.”

O’Malley repeatedly used the word “complexity” as he talked about coactivator codes. He expects that more coactivators will be discovered. Many may turn out to be “molecules with many faces” that exhibit the same kind of contradictory actions as SRC-3, which can function as a cancer promoter or a cancer repressor. O’Malley also anticipates that eventually researchers will be able to describe the different combinations of factors that determine activation codes, death codes and transcriptional time clocks governing biological processes at the cellular level.

A better understanding of these complexes will ultimately lead to therapeutic applications, O’Malley concluded. “These have been associated with 163 human diseases,” he said. “They’re going to be big in disease, which means they’ll also be big in pharmacology when we learn how to manipulate them.”

(Note: O’Malley is a co-director of the Nuclear Receptor Signaling Atlas, a trans-NIH consortium, and a major contributor to educational material about nuclear receptor signaling available on the organization’s [website](#).)

[Return to Table of Contents](#)



*O’Malley’s fast-paced, detailed presentation kept many audience members, like Visiting Fellow Liangli Wang, Ph.D., on the edge of her seat. (Photo courtesy of Steve McCaw)*



*IRTA Fellow Negin Martin, Ph.D., was one of several scientists who participated in the vigorous question and answer session that followed O’Malley’s talk. (Photo courtesy of Steve McCaw)*

# TGen President Outlines System Medicine Approach

By Eddy Ball

Rodbell Auditorium filled quickly on May 3 with scientists eager to hear Jeffrey M. Trent, Ph.D., speak on the topic “Systems Medicine in Cancer Therapeutics.” In the course of his talk, the researcher discussed recent advances in his group’s efforts to translate genomic discoveries into effective therapies for patients with treatment-resistant cancers.

In 2000, Trent founded the non-profit biomedical research institute Translational Genomics Research Institute or TGen, headquartered in Phoenix, Ariz., and he has been president and scientific director ever since. Prior to forming the company, Trent served for ten years at NIH, where he founded and directed the intramural division of the National Human Genome Institute that was in charge of coordinating and finalizing the Human Genome Project.

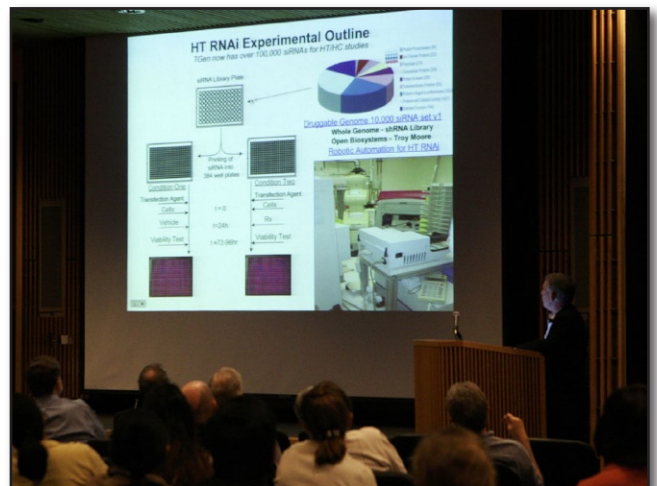
Under Trent’s leadership, TGen has assembled a team of nearly 300 laboratory scientists, computer experts, biomedical engineers, clinical partners and support personnel who are taking the knowledge gained from the Human Genome Project and creating practical discoveries that will ultimately help diagnose and treat many diseases. TGen has built a network of collaborators to enhance its resources, forming relationships with such organizations as the Mayo Clinic Scottsdale, the IBM Functional Genomics and Systems Biology Group, the University of Arizona Medical School, several private companies, and a number of specialized non-profits and foundations.

“What distinguishes us,” Trent observed at the beginning of his presentation, “... is that when we decided to build an institute that would be internationally recognized, we realized that we had to have an infrastructure that would be commensurate with trying to utilize the information available from the Genome Project in a major way.” When TGen began its work, the group had the 53rd most powerful computer in the world — and the top third or fourth in the biomedical field.

Trent’s mantra throughout his talk was that “Density matters” in systems medicine by “adding redundant information and lowering ‘noise’” in pooling-based genome wide association studies. Trent and colleagues at TGen have focused primarily on cellular genomics using very high throughput RNA interference (RNAi) technology to knockdown genes systematically across the genome and determine the functional role of each gene in various cellular processes.



*Trent, left, and Paules were both perplexed when the projector system in Rodbell Auditorium refused to recognize Trent’s Mac, delaying the start of the lecture by nearly 15 minutes and forcing the speaker to step up the pace of his talk. (Photo courtesy of Steve McCaw)*



*The statistics about TGen’s high throughput RNAi were impressive. The group now uses an automated colony picker and has over 100,000 small interfering (si)RNAs available for its genome-wide studies. (Photo courtesy of Steve McCaw)*

“While everyone talks about ‘personalized’ therapeutic decisions,” he explained, “we believe it’s going to take this computationally based process to determine the optimal disease context for any given intervention.” TGen’s pharmacogenomics discovery process moves through comprehensive disease profiling and drug profiling into clinical trial and mathematical modeling — matching the specific molecular context of disease with the most appropriate therapy.

Some of the most exciting work going on at TGen occurs when computational discoveries find their way to the bedsides of patients. Clinicians focus on clinical trials with targeted agents and genomics-based individualized therapy for patients in the Scottsdale Healthcare system, participants at other clinical trial sites and individuals nationwide who contact TGen as their last hope for overcoming their cancers.

Clinicians in TGen’s Genomic Medicine and Individualized Therapy Service Center see only patients who have already been treated unsuccessfully elsewhere for their disease. Researchers are interested in finding a specific treatment based on identifying a target gene. However, if they are unsuccessful, the Center still offers high-quality empirical treatment. In addition to disease remission and progression, patient outcomes include comparison of treatment time at TGen with previous treatment time in other venues.

Trent’s talk was hosted by Senior Scientist Richard Paules, Ph.D., director of the Microarray Group at NIEHS, and sponsored jointly by the Laboratory of Pharmacology and Chemistry, the Laboratory of Molecular Toxicology and the Director’s Challenge Program in Oxidative Stress.

[Return to Table of Contents](#)



*Trent was justifiably proud of his group’s dramatic progress. “Great things can come from humble beginnings,” he said toward the close of the talk. (Photo courtesy of Steve McCaw)*

## **Duke Researcher Discusses Models of Neurodegenerative Diseases**

*By Eddy Ball*

On May 11, the NIEHS Frontiers of Environmental Sciences Lecture Series featured a talk by Neurobiology Professor Donald Lo, Ph.D., the director of the Center for Drug Discovery at Duke Medical Center. Lo discussed results of his recent research with new methodologies in drug development during a talk titled “New Brain Tissue-Based High-Throughput Models for Neurodegenerative Diseases.”

Lo opened his talk with a review of the time and money involved in drug development — as well as the odds, about one in ten, of getting a candidate through the discovery process. Currently, it takes an average of nearly 14½ years, most of it in the discovery and preclinical phases, to take a drug from discovery to clinical use, and the process costs an average of \$802 million.

Those figures encouraged Lo to ask the question, “How do you stack the deck a little bit so that you might have better odds in getting a drug candidate into clinical trial?” Trying to answer that question, Lo and his colleagues borrowed a technique developed for plant research, known as a particle-mediated gene transfer device, to transfect or introduce compounds directly into living brain slices from rodents.

What has emerged is a new high throughput methodology for the discovery stage of drug development. Lo uses what is known as “ballistic delivery” of molecules into the slices. The technique can deliver both the compound(s) that trigger neurodegenerative disease and the compound(s) being tested for potential neuroprotection. Using the technique on disease models they’ve developed, researchers can screen as many as 1,000 compounds and genes every few months.

Lo conceded that the experiments he has conducted using the new methodology are still classified as *in vitro*. However, he has hypothesized that because neurons remain surrounded by live brain tissue, their “native tissue context,” rather than being isolated into cell lines, the methodology allows researchers to add what Lo called “some *in vivo*-ness” to the culture and better mimic how the brain in a living mammal will react.

Lo’s lab tested brain slices in four types of neurodegenerative disease, following a hierarchy of etiologic complexity. The lab’s earliest work focused on ischemic stroke, “a very clean type of trauma,” using an oxygen-glucose deprivation model. Next the lab looked at Huntington’s Disease (HD), a classic monogenic (single-cause) neurodegenerative disease. In recent years, the researchers have begun preliminary studies on the more complex multigenic Alzheimer’s Disease (AD) and Parkinson’s Disease (PD), both of which also may have a strong environmental component.

The group’s early success in testing the effects of two compounds, the plant extract neriifolin and its relative, the FDA-approved drug digoxin, in a stroke model inspired Lo to use the technique with other disease models. The team tested other compounds in an HD model created by transfection with the compound mutant huntingtin (htt) and discovered a good rate of recovery using several htt-specific inhibitory compounds.

“Things just got harder and harder,” Lo admitted as he described preliminary research into more complex disease states. His group’s preliminary work on AD has highlighted the interactions and synergistic effects of causative factors. AD seems to depend on the additive effects of tau, beta amyloid and amyloid precursor protein (APP). Lo has had some success with blocking beta amyloid formation by inhibiting the enzyme secretase.

By far the most complex of the neurodegenerative diseases under study in Lo’s lab is PD, which, research suggests, involves the interaction of genetic predisposition and formation of certain proteins, such as  $\alpha$ -synuclein, to enhance the effects of environmental chemical exposures. Testing is further complicated by the need to get slices containing substantia nigra, the cells impacted in PD, in order to validate results as a step toward developing a PD risk-factor screening test.



*Duke Neurobiologist Don Lo outlined the application of his high-throughput method to a model of Parkinson’s. (Photo courtesy of Steve McCaw)*



*David Armstrong, Ph.D., acting chief of the Laboratory of Neurobiology, hosted the talk by his long-time friend. (Photo courtesy of Steve McCaw)*



*The Frontiers in Environmental Sciences lineup of speakers has had a broad appeal in the NIEHS community. Shown here in profile (center) is Extramural Health Scientist Administrator Jerry Heindel, Ph.D. (Photo courtesy of Steve McCaw)*



*Intramural laboratories were well represented by bench scientists such as (left to right) Christopher McPherson, Kevin Gerrish, Ph.D., Boris Risek, Ph.D., and Ewa Marczak, Ph.D. (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

## **Lineberger Symposium Highlights Virus and Immunity in Cancer**

*By Eddy Ball*

Sponsored in part by NIEHS, the Lineberger Comprehensive Cancer Center held its thirty-first Annual Scientific Symposium on April 24 and 25 at the University of North Carolina's Friday Center. Organizers brought together some of the leading cancer researchers working in areas related to the symposium theme, "Viruses, Immunity and Cancer."

The symposium opened with a welcome from Shelton Earp, M.D., director of the Lineberger Comprehensive Cancer Center, followed by an introduction to the conference theme by Symposium Chair Nancy Raab-Traub, Ph.D. She observed that "between 40 and 50 percent of cancers worldwide involve inflammation or viral infection and the two often work in concert."

Raab-Traub further noted that the introduction of the human papillomavirus vaccine earlier this year has made it especially appropriate for the symposium to revisit the topic of virus and inflammation in cancer. Increasingly, new cancers are being linked to viruses, and immunotherapeutics are being developed utilizing viral agents in the treatment of cancer. Other exciting new research in these areas, she said, involves the inhibition of chemokines and other inflammatory agents in cancer pathways.



*2007 Lineberger Lecturer Bernard Roizman (Photo by Eddy Ball)*

Several speakers, such as Sankar Ghosh, Ph.D., of the Yale University School of Medicine, reported on their basic research into the influence of the inflammatory cascade in initiating cell proliferation and inhibiting apoptosis or programmed cell death. Ghosh focused on the role of nuclear factor kappa beta in the acetylation of histones, an important epigenetic alteration involved in the development of tumors.

Some of the most intriguing reports took place in session three, chaired by Lineberger Director Emeritus Joseph Pagano, M.D., the founder of the symposium series. The keynote speaker of the April 25 session was Bernard Roizman, Sc.D., a Distinguished Service Professor of Virology at the University of Chicago and the 2007 Lineberger Lecturer. Roizman spoke on the topic “Targeting Herpes Simplex Virus Mutants for Therapy of Glioblastoma Multiforme,” the most common and aggressive of the primary brain tumors.

In the course of his research, Roizman has mapped the genome of herpes simplex virus and developed recombinant DNA techniques that have enabled him and others to determine the role of specific genes in viral infection and replication. Roizman’s experimental treatment combines radiation to sensitize cells with novel viruses that specifically target cancer cells and selectively destroy them without affecting normal cells. In experiments with mice, his lab has demonstrated reduction of tumors to almost undetectable levels over a nine-month treatment course.

Baylor College of Medicine Professor Stephen Gottschalk, M.D., reported on a series of bench-to-bedside interventions employing adoptive immunotherapy with cytotoxic T-cells. Gottschalk has used the therapy in patients with advanced cases of the Epstein-Barr Virus (EBV)-associated cancers Nasopharyngeal carcinoma (NPC) and Hodgkin’s disease.

His group’s therapeutic approach has the major advantage of specifically targeting malignant cells with minimal side effects. Although the patient groups are small, under ten patients, he has shown that administration of the immunotherapy to patients with advanced, EBV-positive NPC or Hodgkin’s disease is feasible and safe and results in significant anti-tumor activity in a remarkable number of these patients.

NIEHS used funds from the Division of Intramural Research and the Office of the Director to fund its Leadership Sponsorship of the event. Its support, along with the support other university and outside sponsors, helped to disseminate the results of cutting-edge research in cancer, much of it supported by NIH grants.

[Return to Table of Contents](#)

## **Intramural Research Accomplishments 2006**

In its [March-April 2007 issue](#), the editors of the *NIH Catalyst* listed brief summaries of intramural research accomplishments from the NIH institutes and centers. In the areas that fit the Institute’s research agenda and mission, NIEHS researchers were disproportionately well represented. Numbers in parentheses refer to how many NIEHS studies and how many total studies were recognized in each category.

### **Identification of Disease Genes (2 of 5)**

- Identification of the *K55R* polymorphism variant allele in association with increased risk of coronary heart disease in Caucasians in a community-based study of atherosclerosis risk, implicating *EPHX2* as a potential cardiovascular disease-susceptibility gene —

[Lee CR, North KE, Bray MS, Fornage M, Seubert JM, Newman JW, Hammock BD, Couper DJ, Heiss G, Zeldin DC. 2006.](#) Genetic variation in soluble epoxide hydrolase (EPHX2) and risk of coronary heart disease: an Atherosclerosis Risk in Communities (ARIC) study. *Hum Mol Genet* 15:1640-1649.

- Single mutations in the human master regulator p53 found to dramatically alter cellular response to environmental stress, potentially exerting an effect on tumor development and therapeutic efficacy —

[Menendez D, Inga A, Resnick MA. 2006.](#) The biological impact of the human master regulator p53 can be altered by mutations that change the spectrum and expression of its target genes. *Mol Cell Biol* 26:2297-2308.

## **Basic Discoveries in Cell, Molecular, and Structural Biology with Implications for the Treatment of Human Disease (3 of 56)**

- Discovery of a new molecular mechanism for thyroid hormone action, providing new insight into the role of thyroid hormone in human brain, heart, lipid and neuronal matters and underscoring concerns about agricultural chemicals that interfere with thyroid hormone activities and such public-health problems as learning disorders, cardiovascular disease, obesity and depression —

[Storey NM, Gentile S, Ullah H, Russo A, Muessel M, Erxleben C, Armstrong DL. 2006.](#) Rapid signaling at the plasma membrane by a nuclear receptor for thyroid hormone. *Proc Natl Acad Sci USA* 103:5197-5201.

- Structural analysis of DNA strand slippage that generates deleterious mutations underlying disease, supporting a decades-old but previously unproven idea —

[Garcia-Diaz M, Bebenek K, Krahn JM, Pedersen LC, Kunkel TA. 2006.](#) Structural analysis of strand misalignment during DNA synthesis by a human DNA polymerase. *Cell* 124:331-342.

- *TLR4* gene found to protect against tumor development in mice, suggesting that targeting the innate immune system may be useful in fighting human diseases, including cancer —

[Bauer AK, Dixon D, DeGraff LM, Cho H-Y, Walker CR, Malkinson AM, Kleeberger SR. 2005.](#) Toll-Like Receptor 4 in Butylated Hydroxytoluene-Induced Mouse Pulmonary Inflammation and Tumorigenesis. *J Natl Cancer Inst* 97:1778-1781.

## **Development of New or Improved Approaches for Preventing or Delaying the Onset or Progression of Disease and Disability (1 of 16)**

- Finding that overweight and obese men have decreased fertility, with a 20-pound increase yielding a ten percent increase in infertility risk —

[Sallmen M, Sandler DP, Hoppin JA, Blair A, Baird DD. 2006.](#) Evidence for reduced fertility among overweight and obese men. *Epidemiology* 17(5):520-523.

[Return to Table of Contents](#)



# Extramural Update

During a recent science retreat, staff of the NIEHS Division of Extramural Research and Training formulated funding projects based on an analysis of the current extramural grants portfolio and how closely it conforms to the goals of the NIEHS Strategic Plan. With this formulation, the division established a reference point to help chart progress in addressing the Strategic Plan and identifying research needs in coming years.

Prior to the retreat DERT staff developed an analysis tool that provided a detailed annotation of all active NIEHS R01 and R21 grants. For each individual grant, staff identified which of the seven research goals of the Strategic Plan was being addressed, the disease focus, the tissue being studied, the model used (in vitro, animal, human), the environmental agent examined, the technology used and the professional degree of the principal investigator (PI).

At the morning session, DERT staff presented the analyses with regard to the Strategic Plan goals. Discussions focused on both the numbers of grants in each Strategic Plan goal and how the research was divided within each Plan goal (disease, tissue, environmental agent, technology focus and PI degree).

During the afternoon session, staff presented a more in depth analysis of selected grant portfolios: Reproductive/ Endocrine Disruptor, Respiratory, Brain/Nervous System, Cancer/DNA Repair, Metabolism, Immune System and Technology followed by an extensive discussion session for each topic. Questions addressed included the strengths and weaknesses of the portfolio, the progression from basic to clinical and opportunities/barriers for conducting translational research in that program. The three scientific research areas most represented in the portfolio were Reproductive/Endocrine (159 awards), Neuroscience (115) and Respiratory (59) of 562 grants examined. The three environmental agents most studied were Metals (91), Air Pollutants (69) and Dioxins/Furans (48).

The retreat ended with a discussion on how best to improve the portfolio analysis, how to create an information technology database that will be automatically updated and annotated to reflect the content of active awards and how to use this data most effectively to prioritize workshops and initiatives over the next few years.

[Return to Table of Contents](#)

## Strategic Plan Goal (# Grants/562)

**Goal 1:** Clinical Research (18)

**Goal 2:** Toxicant Mechanisms (368)

**Goal 3:** Integrated Research (18)

**Goal 4:** Global Health (33)

**Goal 5:** Biomarkers (34)

**Disease Focus:** (334)



## DETR Papers of the Month

By Jerry Phelps

### Inhibition of RelB Synthesis by ER $\alpha$ Signaling Controls the Shift in Breast Cancer Cell Phenotypes

Inhibition of RelB Synthesis by ER $\alpha$  Signaling Controls the Shift in Breast Cancer Cell Phenotypes.

RelB is a widely expressed protein involved in the regulation of genes involved in cell-to-cell interaction, intercellular communication, cell recruitment, spreading of pathogenic signals, cell apoptosis, and initiation or acceleration of tumorigenesis. RelB complexes are often found in mouse mammary tumors, but little is known about the function of RelB in relation to human breast cancer.

NIEHS grantee Gail Sonenshein at the Boston University School of Medicine reports in the April issue of *Nature Cell Biology* research findings that connect RelB with the estrogen receptor alpha (ER $\alpha$ ). In invasive ER $\alpha$ -negative breast cancer cells, her team found active synthesis of RelB; however, ER $\alpha$  signaling led to an inhibition of RelB synthesis, leading to an inverse correlation between *RelB* and *ER $\alpha$*  gene expression in human breast cancer tissues and cell lines. Additional studies demonstrated that RelB promotes a more invasive type of ER $\alpha$ -negative breast cancer cells.

This work provides further understanding of the role of RelB in human breast cancer and indicates that inhibition of RelB synthesis represents a mechanism by which ER $\alpha$  can control the shift of epithelial cells to a more invasive phenotype. The authors conclude that further studies are warranted to determine if RelB is useful as a marker or in therapeutic approaches for the detection and treatment of metastatic breast cancer.

*Citation:* [Wang X, Belguise K, Kersual N, Kirsch KH, Mineva ND, Galtier F, Chalbos D, Sonenshein GE. 2007. Oestrogen signalling inhibits invasive phenotype by repressing RelB and its target BCL2. Nat Cell Biol 9\(4\):470-478.](#)

[Return to Table of Contents](#)

### Riboflavin Activated by UV Exposure Causes Oxidative DNA Damage, Which Is Inhibited by Vitamin C

NIEHS grantee Gerd Pfeifer and colleagues at the Beckman Research Institute report intriguing results of experiments involving the essential vitamin riboflavin. They found that riboflavin causes oxidative DNA damage when it is activated by ultraviolet radiation in a mouse fibroblast cell culture model. These effects were blocked when vitamin C was co-administered.

Pfeifer is one of only nine current Method to Extend Research In Time (MERIT) grantees at NIEHS. This is a prestigious award given only to very highly productive researchers who are leaders in their respective fields and have a history of good grantsmanship.

This work expands on a popular theory that wavelengths of light in the ultraviolet A (UVA) range trigger intracellular photosensitization reactions, leading to promutagenic oxidative DNA damage. Riboflavin,

also known as vitamin B2, is known to be a cellular photosensitizer and was shown in the current studies to intensify the UVA-induced damage. However, vitamin C at a physiologic relevant dose exerted antioxidant effects and protected the cells from oxidative DNA damage. These findings confirm that UVA induced-genotoxicity is caused by intracellular photosensitization reactions, which generate oxidative and promutagenic damage to DNA.

*Citation:* [Besaratina A, Kim SI, Bates SE, Pfeifer GP](#). 2007. Riboflavin activated by ultraviolet A1 irradiation induces oxidative DNA damage-mediated mutations inhibited by vitamin C. *Proc Natl Acad Sci U S A* 104(14):5953-5958.

[Return to Table of Contents](#)

## **Autism Disorder Risk Increased in Babies of Mothers with Glutathione S-Transferase P1 Haplotype**

Grantees from the NIEHS-supported Center for Childhood Neurotoxicology and Exposure Assessment at the University of Medicine and Dentistry of New Jersey have found a positive correlation between a diagnosis of autism in children and a polymorphism in a gene coding for the enzyme glutathione S-transferase (GST) in their mothers. This finding suggests that autism may be the result of a gene-environment interaction and suggests a possible mechanism for the design of strategies for prevention and treatment.

The researchers determined the frequency of glutathione polymorphisms in 137 members of 49 families with histories of autism disorder. Autism was confirmed using two common diagnostic screening methods. They found that the autism case mothers were 2.7 times more likely to carry the *GSTP1*\*A haplotype. GSTs are active in the detoxification of endogenous compounds such as peroxidized lipids as well as the metabolism of xenobiotics.

If confirmed by additional studies, this finding represents a major step in determining whether autism disorders are the result of gene-environment interactions. It also raises questions as to whether the effect is the result of conjugation of glutathione with toxins. These results may provide insight into the toxins that might cause the effect and could lead to the therapeutic or preventive strategies for autism disorders.

*Citation:* [Williams TA, Mars AE, Buyske SG, Stenroos ES, Wang R, Fatura-Santiago MF, Lambert GH, Johnson WG](#). 2007. Risk of autistic disorder in affected offspring of mothers with a glutathione S-transferase P1 haplotype. *Arch Pediatr Adolesc Med* 161(4):356-361.

[Return to Table of Contents](#)

## **Radiation-Induced Male Sterility Is due to Damage in the Somatic Testicular Cells and not the Spermatogonia**

Researchers at the University of Texas M.D. Anderson Cancer Center have discovered that male sterility caused by exposure to radiation, such as that experienced during cancer treatment, is due to damage to the somatic cells within the testis — and not, as widely believed, a direct effect of damage to the spermatogonial stem cells.

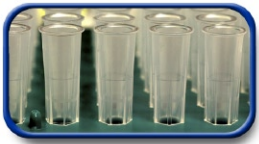
The investigative team used laboratory rats and mice to conduct their experiments; however, they are confident that the results will hold true for humans. They transplanted populations of rat testicular cells containing stem spermatogonia that express green fluorescent protein into a variety of host animals. Transplantation into

irradiated rat testes showed that the stem cells were able to colonize their new surroundings, but were not able to develop and grow — a process called differentiation.

With the advances in cancer therapy leading to longer survival, quality of life issues especially in children and young adults are increasingly important. Autologous transplantation of preserved spermatogonia is being investigated as a potential method to regenerate spermatogenesis in former cancer patients treated with chemotherapy or radiation. These findings suggest that transplanted spermatogonial stem cells may not be able to differentiate due to damage to other testicular cells and further suggest that additional treatments focusing on the somatic environment may be necessary.

*Citation:* [Zhang Z, Shao S, Meistrich ML](#). 2007. The radiation-induced block in spermatogonial differentiation is due to damage to the somatic environment, not the germ cells. *J Cell Physiol* 211(1):149-158.

[Return to Table of Contents](#)



## DIR Papers of the Month

*By Eddy Ball*

### Defects in mtDNA Replication Linked to Cardiac Dysfunction

In a study funded in part by NIEHS, researchers in the Laboratory of Molecular Genetics collaborated with investigators at the Emory University School of Medicine and the National Jewish Medical Center to study effects of mutant polymerase gamma (Pol  $\gamma$ ) on organ dysfunction and premature death. They evaluated the effects of the mutation on oxidative stress and cardiac parameters in four lines of transgenic (TG) mice with wild type (WT) mice as controls.

The researchers used TG mice generated with a cardiac-targeted human mutant of the gene, *POLG*, that encodes Y955C Pol  $\gamma$ , resulting in stalling in mitochondrial DNA (mtDNA) synthesis. This mutation produced interference in mtDNA replication, oxidative stress, cardiac dysfunction and premature death — as early as 90 days post partum in the most severely affected TG line (D) as compared to an average of more than 600 days in WT animals. Examination of hemi-sections of thorax in TG line (D) animals, terminated at 21 days, showed massive enlargement of the heart with bilateral atrial enlargement consistent with congestive heart failure.

This study design overcame an important deficit of earlier studies by experimenting with a Pol  $\gamma$  mutation that had a pathophysiologically based counterpart in human disease — with findings that “forge a pathogenetic link between defective mtDNA replication and cardiac dysfunction.”

*Citation:* [Lewis W, Day BJ, Kohler JJ, Hosseini SH, Chan SS, Green EC, Haase CP, Keebaugh ES, Long R, Ludaway T, Russ R, Steltzer J, Tioleco N, Santoianni R, Copeland WC](#). 2007. Decreased mtDNA, oxidative stress, cardiomyopathy, and death from transgenic cardiac targeted human mutant polymerase gamma. *Lab Invest* 87(4):326-335.

[Return to Table of Contents](#)

# Advances in Detection of Pre-Invasive Lung Cancer in LIFE Study

Investigators in the NIEHS-funded Light Induced Fluorescence Endoscopy (LIFE) project have reported on enhanced detection of pre-invasive lesions using fluorescent bronchoscopy and on improvements to molecular analysis using laser capture microdissection (LCM) of frozen biopsy specimens.

Investigators from NIEHS collaborated with UNC Medical Center researchers in the six-year LIFE study of 47 high risk patients with a history of lung or upper respiratory cancer or who were current or former smokers with at least a 15 pack-year history. The patients underwent bronchoscopy at the time of enrollment in 1999, and 22 underwent follow-up bronchoscopies. During the study, researchers collected 390 snap-frozen biopsies from 106 bronchoscopic procedures — producing a total of almost 4,000 diagnostic slides.

Researchers confirmed the superior detection rate of the fluorescence technology and its ability to localize lesions as small as 0.5 mm, about one-tenth the size of the smallest identified by white light. They also determined that “snap-freezing [of biopsy specimens] was optimal for molecular studies since it avoided the cross-linking induced by formalin fixation” and preserved “the morphologic features of the bronchial mucosa.” In addition, LCM produced “virtually pure epithelial cell populations” from bronchial biopsies, aiding in the search for molecular biomarkers of the disease at its most treatable stage.

*Citation:* [Flake GP, Rivera MP, Funkhouser WK, Maygarden SJ, Meadows KL, Long EH, Stockton PS, Jones TC, Yim HW, Slebos RJ, Taylor JA.](#) 2007. Detection of pre-invasive lung cancer: technical aspects of the LIFE project. *Toxicol Pathol* 35(1):65-74.

[Return to Table of Contents](#)

# Role of Retinoid-Related Orphan Receptor $\gamma$ in Inflammatory Disease

Researchers in the NIEHS Laboratories of Respiratory Biology and Experimental Pathology collaborated with UNC scientists to describe control by Retinoid-Related Orphan Receptor gamma (ROR $\gamma$ ) of antigen-induced inflammation in animals. Their study was funded jointly by NIEHS intramural and NIH extramural grants.

The investigators studied the responses of ROR $\gamma$  deficient mice and their wild type (WT) littermates to chicken ovalbumin to induce allergic inflammation. Following an exposure regimen over a 19-day period, the researchers evaluated lung lavage fluid and lung sections for inflammatory, eosinophils and lymphocytes, immunoglobulins and other markers of the adaptive immune response.

They reported “unexpected increases” in tumor necrosis factor- $\alpha$ , interleukin (IL)-2, and interferon- $\gamma$  along with reciprocal reductions in IL-4, IL-5 and IL-13 — possibly the result of several mechanisms working in concert. The results indicated that cytokine profiles were altered and allergic lung inflammation profoundly blunted in ROR $\gamma$ -deficient mice, as compared to WT mice. These observations suggest that activation of ROR $\gamma$  augments the inflammatory response.

The results of the study add significantly to the understanding of the contribution of this member of the ROR subfamily in controlling the adaptive immune response. The authors called for “further studies of the role of ROR in immune cell function and host defense ... to determine whether ROR antagonists could provide useful therapeutic strategies for asthma and other inflammatory disease.”

*Citation:* [Tilley SL](#), [Jaradat M](#), [Stapleton C](#), [Dixon D](#), [Hua X](#), [Erikson CJ](#), [McCaskill JG](#), [Chason KD](#), [Liao G](#), [Jania L](#), [Koller BH](#), [Jetten AM](#). 2007. Retinoid-related orphan receptor gamma controls immunoglobulin production and Th1/Th2 cytokine balance in the adaptive immune response to allergen. *J Immunol* 178(5): 3208-3218.

[Return to Table of Contents](#)



## Inside the Institute

### Institute Shows Off Its “Green” Side on Earth Day 2007

*By Eddy Ball*

On April 22, 1970, environmentalists led by then Senator Gaylord Nelson spear-headed the massive grass roots demonstration that came to be known as “Earth Day.” Almost to the day thirty seven years later, environmentalists at NIEHS celebrated the event with a creek clean-up in Durham, an invited lecture on practical steps to achieve sustainability and an Earth Day Fair full of good information for environmentally conscious Institute and contract employees.



In a 1993 retrospective, *American Heritage Magazine* called the keynote event “one of the most remarkable happenings in the history of democracy.” Although the first Earth Day was longer on hair and rhetoric than practical alternatives, it set into motion nearly four decades of progress — leading to tangible results from conservation, recycling and alternative energy advancements.

Today, the Institute has a full-time employee, Environmental Compliance Specialist Bill Steinmetz, overseeing development of an ISO 14000-compliant Environmental Management System to build on other advances in conservation and alternative energy development (see text box).

Earth Day 2007 began with an April 21 clean-up of South Ellerbee Creek near downtown Durham. Volunteers from across the Triangle collected everything from porcelain stoves and tin roofing to rusty bicycles and shopping carts. New sewer work recently opened up an unseen section of South Ellerbe that could best be described as a large, under-water Durham History Museum — for NIEHS Volunteer John Schelp, “a poignant reminder that our work is never done.”



*Environmental Specialist Bill Steinmetz, reading in the background, and Hazardous Waste Specialist Carranza Smith, seated left, greeted visitors, such as Shipping Cashier William Boyd, who had questions about how they can do their part to promote sustainability. (Photo courtesy of Steve McCaw)*

On April 23, invited guest lecturer Larry Shirley, director of the State of North Carolina Energy Office, spoke on “Sustainable Energy Strategies for North Carolina.” Hosted by Employee Services Support Specialist Dick Sloane, the talk focused on energy efficiency, renewable energy resources, alternative fuels and vehicles, and state-coordinated strategies for dealing with energy emergencies.

The world is peaking or nearing the peak in non-renewable energy production at the same time that demand is rising sharply, Shirley explained at the beginning of his lecture. No one is certain when the “slippery slide” will happen, he said, but within a generation or two the disparity between supply and demand will reach a crisis state. Shirley devoted the rest of his talk to discussing the very significant accomplishments of North Carolinians in the private and public sectors — and the equally significant challenges the state faces in its quest for sustainability.



*Dick Sloane helped promote bird houses at the event. His table had photos of some of the many species of birds that make our campus home. (Photo courtesy of Steve McCaw)*

## Environmental Accomplishments at NIEHS

### (Initiated by individuals and groups from several different branches within the Institute)

By Environmental Compliance Specialist Bill Steinmetz

- NIEHS typically recycles over 60 percent of its solid waste stream. Nearly 10,000,000 pounds (5,000 tons) of waste have been recycled at the NIEHS since February 1993.
- The majority of our NIEHS fleet vehicles are fueled with E85 (85 percent ethanol/15percent gasoline) from our onsite tank. This program is mandated by an Executive Order to reduce petroleum usage by federal fleet vehicles.
- NIEHS operates three composting bins that use vermi-technology (worms) to turn pre-consumer cafeteria waste and shredded paper into usable mulch. About 5,000 pounds of pre-consumer produce waste are composted per year through onsite vermicomposting.
- NIEHS has a mercury thermometer exchange program to reduce the potential for mercury to enter the environment via the sanitary sewer. Over 650 mercury-filled thermometers have been collected and exchanged for safer alternatives since 2001.
- The existing emergency phone network is being upgraded with solar powered stations This effort limits ground-disturbing activities and conserves electricity over time.
- NIEHS was the first individual facility in RTP to become Wildlife and Industry Together (WAIT) certified. The certification requires the development of an employee education program and other activities to manage, protect and promote onsite wildlife.
- The Institute is recognized as an Environmental Partner within the NCDENR Environmental Stewardship Initiative (ESI). The ESI requires a commitment toward improving environmental performance beyond traditional levels of compliance through Environmental Management System (EMS) implementation.
- NIEHS has been designated as “A Best Workplace for Commuters” since 2004.

Earth Day 2007 events concluded on April 24 with the Earth Day Fair in the lobby of the Rall Building. The Fair featured several tables with information about conservation, recycling and other environment-friendly topics, such as bird and bat houses, native plant cultivation and vermicomposting. In addition to providing information, Earth Day volunteers urged visitors to take the Earth Day Pledge — committing themselves to specific steps for improving the health of the planet.



*At the Reduce, Reuse, Recycle Table, Biologist Jessica Ramsberger talked with Health Scientist Administrator Mike Humble, Ph.D., as he signed his Earth Day Pledge. Ramsberger is an employee of the National Heart, Lung and Blood Institute on assignment in the NIEHS Environmental Lung Disease Laboratory, where she acts as Colony Manager for a large transgenic and knockout mouse colony. (Photo courtesy of Steve McCaw)*



*After his presentation, Earth Day Lecturer Larry Shirley talked with employees about tangible ways to improve their carbon footprint. Biologist Laura Hall described the slope of the roof on her home as she asked Shirley, who turned out to be the former owner of her house, about alternative energy possibilities. (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

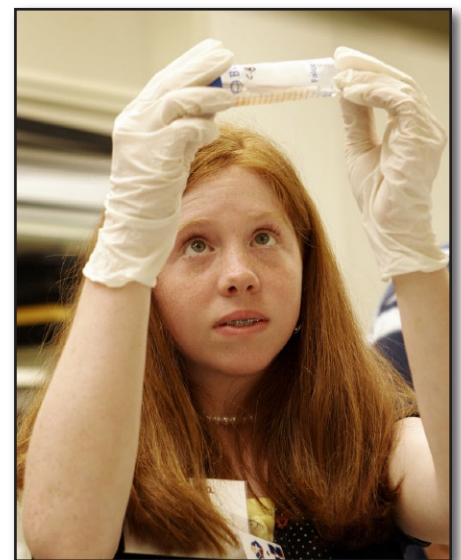
## Take Your Child to Work Day

*By Eddy Ball*

Each year, twenty lucky kids between the ages of eight and fifteen get a chance to see what their parents do at work by attending the NIEHS Take Your Child to Work Day, which coincides with Earth Day. To make sure more children get the chance to experience the program, participants must not have been a part of the program the previous year.

On April 24, this year's group gathered in Rodbell Auditorium to begin their day of exploration at the Institute. According to Health and Safety Branch rules, the children could not enter potentially hazardous areas such as shops, animal facilities and labs, except for scheduled activities.

The kids participated in Earth Day activities coordinated by Dick Sloan and visited special "child-proofed" labs where they engaged in hands-on experiments in performing DNA isolation, testing pH of different substances and making own "flubber," a gooey polymer with a distinctive



*After careful instruction by NIEHS scientists, this young researcher had a chance to see how precipitated DNA looks without magnification. (Photo courtesy of Steve McCaw)*



appeal for kids. The activities shown here were linked to familiar aspects of home life and contemporary “kid culture” and supervised by Biologists Rachael Patterson, Cindy Innes, Colleen Anna, Kristine Witt, Ron Cannon, Ph.D., and Veterinary Medicine Section Chief Terry Blankenship-Paris, D.V.M.



*Cindy Innes, left, and Terry Blankenship-Paris, second from right, help the kids precipitate the DNA they were isolating. (Photo courtesy of Steve McCaw)*



*Ron Cannon showed the kids the final “DNA fingerprints” that determined “who stole the cake” in the CSI crime scene experiment. The activity involved isolating DNA, viewing the DNA run on a gel and evaluating the results under UV light. (Photo courtesy of Steve McCaw)*



*Rachel Patterson, center, demonstrated the pH experiment to the kids as Christine Witt looked on. The kids then tested their choice of household consumer items for pH properties. By testing for pH, the young investigators learned that baby shampoo is called “no more tears” because it has a neutral pH, while adult shampoo is acidic. (Photo courtesy of Steve McCaw)*



*With more participants than instructors, the kids occasionally had to wait for their turn. However, these good-natured kids seemed to enjoy themselves even when they weren't actively engaged in activities. (Photo courtesy of Steve McCaw)*

[Return to Table of Contents](#)

# NIEHS Health and Fitness Week Promotes Healthy Lifestyles

By Eddy Ball

In a series of events held May 15 - 18, the NIEHS Health and Fitness Week used education, humor and athletics to promote healthier lifestyles for employees and contractors. The events were sponsored by the Office of Management Health and Fitness Organizing Committee and several other NIEHS employee interest groups. Events included three health seminars and no fewer than 17 recreational and lifestyle events.

Educational offerings for the week began on May 14 with a seminar on “Stress Reaction: Increase Your Control” by Rob Quinn, who works NIEHS employees participating in the Employee Assistance Program. During a talk hosted by Occupational Health Nurse Lindia Ingram, Quinn discussed the signs of stress and offered several physical response and cognitive strategies for defusing stress before it leads to serious health, safety or relationship problems.

Rodbell Auditorium was the site of the week’s Health Fair on May 15 as representatives of area healthcare practitioners, medical equipment suppliers and health awareness groups set up tables with helpful information for NIEHS employees and contractors. Demonstrations included chiropractic and energy kinesiology, spinal health and glucose testing.

The relationship between humor and health was at center stage during a lunchtime presentation on May 16 by Gastroenterologist Henry R. Lesesne, M.D., a professor in the UNC Medical School. Lesesne has developed research interests in the spiritual aspects of health and healing and is one of the Medical School’s most popular speakers. Like the legendary Patch Adams, Lesesne has discovered that laughter can actually trigger psychological and physiological processes that promote health and help prevent disease.

In conjunction with the Institute’s Women’s History Month Subcommittee, Health and Fitness Week organizers sponsored a lunch time presentation on May 17 by Duke Cardiologist Radha Kacchy, M.D. Kacchy addressed the gender-specific aspects of cardiac disease, as well as warning signs women should keep in mind as they age. Her talk focused on the problems women face post-menopause, including development of Metabolic Syndrome.

Health and Fitness Week also featured a host of events during which participants could test their physical prowess. These competitions ranged from a basketball shootout, football throw contest and golf outing to table tennis and electric slide contest.



*“Physician heal thyself” seemed to be the slogan of the day for Counselor Rob Quinn. He looked ready to try his stress-relief techniques out on himself after arriving late for his talk. (Photo courtesy of Steve McCaw)*



*Chiropractor Angelina Stevens helped Charle League get a little mid-day relief from the stress of managing this year’s Summers of Discovery. (Photo by Eddy Ball)*

The most popular competitive event, however, was the annual “Rogathan” 5K Run and 2 Mile Nature Walk,” with laurels going to Liam O’Fallon as overall winner, Rebecca Boyles as First Place Female and Stella Sieber as Trike Winner. Mike Resnick deserved special mention for winning in the age 60 and over group with a time of 26 minutes, 30 seconds — better than 14 of the nearly 35 competitors, some of them as much as half his age.

The week drew to a close with the Bike-to-Work Day Event on the morning of May 18. Organizer Dick Sloane was on hand with his recumbent bicycle to welcome the handful of bike commuters who came to work on one of this spring’s most delightful days.



*Energy Kinesiologist Jan Stevens demonstrated how pressure point manipulation can promote energy healing. (Photo by Eddy Ball)*



*Duke Cardiologist Radha Kacchy made certain the women in her audience took home the message that cardiovascular disease, rather than breast cancer, is the number one killer of women. (Photo by Eddy Ball)*



*Dick Sloane has ridden a bike to work for 26 years. His latest mount is a state-of-the-art recumbent bicycle. According to enthusiasts, these bikes can be ridden for hours and miles without ailments such as the sore bottom, stiff neck, aching shoulders or numb hands that afflict the conventional bicycle rider. (Photo by Eddy Ball)*



*Cyclists Ed Downing (left), Friederike Jayes and Ken Rudd rode more conventional machines, but they still enjoyed the physical and financial benefits of getting to work via leg power. (Photo by Eddy Ball)*

[Return to Table of Contents](#)

# Imperial Center Live at Lunch

*By Eddy Ball*

Several NIEHS employees working out of Nottingham Hall took advantage of free food and music at the annual Imperial Center Live at Lunch on May 3 in the Chelsea Place parking lot. The event took place during the hours of noon and featured the rock and roll cover band Groovetown, fast food courtesy of Arby's and information booths for Imperial businesses and triangle non-profits.

For people who attended Live at Lunch, cooler temperatures and overcast skies were a welcome break from the day before when temperatures had reached the high eighties and the sun was bright. Although Groovetown covered some lively hits of the seventies and eighties, the office types in Chelsea Place, Nottingham and other Imperial properties were too busy eating and socializing to get up and move.



*The food was free and abundant — even if it was not especially nutritious or heart healthy. (Photo by Eddy Ball)*



*Groovetown's bass player and vocalist helped the band present a pretty decent cover of Van Morrison's "Brown-Eyed Girl." (Photo by Eddy Ball)*



*Office of Director Secretary Betty Mills seemed grateful for the break from her routine in Nottingham Hall. (Photo by Eddy Ball)*



*Office of Management Secretary Mary Alexander shared a laugh with friends over lunch. (Photo by Eddy Ball)*



Bethesda-based NIH Human Resources Specialist Dinah Peters, center, took advantage of a break in training to join IRB Protocol Specialist Darlene Switalski, right, and HR Specialist Phil Hanson at the event. (Photo by Eddy Ball)



Representatives of the Triangle Clean Cities Coalition found it a little challenging to compete with food and music. (Photo by Eddy Ball)

[Return to Table of Contents](#)

## Employee's Daughter Honored by Girl Scouts

By Eddy Ball

Biologist Margaret George and her husband Michael have good reason to be proud of their daughter, Megan. The Girl Scouts of the U. S. A. recently announced that the seventeen-year-old has been chosen as one of the 13 top Girl Scout Gold Award Winners who will be honored as 2007 Young Women of Distinction at a ceremony in Washington, D.C. on June 12.

The award honors young women for extraordinary leadership demonstrated in community service projects lasting one to two years. George and the other 12 winners were selected from a group of 250 applicants who had already earned the Girl Scout Gold Award — a select group of Girl Scouts aged 14 – 18 who devote 65 hours or more to community service projects that make a difference in their communities. Only five to six percent of scouts earn the award each year.

George is being recognized for her work on several educational programs. These included a conference, "Starting Equal and Falling Behind," that focused on the growing educational gap in the public schools and addressed possible solutions to minimize this disparity among students. George involved community leaders, students, parents and ministers in her effort to increase awareness for the cause.



Megan Cheryle George  
(Photo courtesy of Margaret George)

Along with her commitment to service, the Raleigh teenager also has ambitious plans for her future. She is a senior in Wake County's Leesville Road High School who plans to attend the University of North Carolina at Greensboro (UNC-G) as a Political Science major. After she finishes at UNC-G, George wants to pursue a degree in law at North Carolina Central University in Durham.

Margaret George has worked at NIEHS for over 20 years, and Michael George is a former NIEHS employee now working at the Environmental Protection Agency. Like their daughter, both of the Georges are involved in community service activities.

[Return to Table of Contents](#)

## Calendar of Upcoming Events

- **June 1** in Rodbell, 9:00 – 10:00 — Frontiers in Environmental Sciences Lecture Series featuring Vann Bennett, M.D., Ph.D. (Duke University & Howard Hughes Medical Institute), speaking on “Better Living Through Ordering the Fluid Lipid Bilayer: Ankyrin-Based Organization of Membrane-Spanning Proteins in Specialized Domains”
- **June 1** (12:00) **Offsite Event** at Duke University in Durham, 103 Bryan Research Building — Handler Memorial Lecture featuring 2002 Nobel Prizewinner Kurt Wuthrich, Ph.D., speaking on “Protein Structure, Protein Folding and NMR in Solution”
- **June 5** in B-200, 11:30 – 2:00 — Gay, Lesbian, Bisexual and Transgender Diversity Event, Videocast of the NIH Pride Month Seminar, otherwise known as “Noons-in-June” featuring Dr. Ilan Meyer (Columbia University / Mailman School of Public Health)
- **June 5** (3:00 – 4:00) **Offsite Event** at Duke University in Durham, Room 240, Fitzpatrick-CIEMAS Building — Genome Biology Forum featuring Greg Crawford, Ph.D., speaking on “Identification and Characterization of Gene Regulatory Elements.”
- **June 5** in Executive Conference Room, 12:00 – 1:00 — Receptor Mechanisms Discussion Group featuring Brian Stahl, Ph.D. (N. C. State University), speaking on “Histone Modifications in RNA Polymerase II Transcription”
- **June 6** in Rall F193, 11:00 – 12:00 — Laboratory of Neurobiology Seminar featuring Jerry Yakel, Ph.D., speaking on “Nicotinic Receptor Channel; Structure, Function, and Possible Roles of Neurological Disorders and Disease”
- **June 8** in Rodbell, 9:00 – 10:00 — Frontiers in Environmental Sciences Lecture Series featuring David Goldston (Princeton University Woodrow Wilson School of Public and International Affairs), speaking on “Loving Science to Death: How and Why Politicians Use and Misuse Science in Policy Debates”
- **June 10** (4:00 – 6:00) **Offsite Event** — [Dance Day](#) with [Anna Halprin](#) South Lawn of the Terrace Garden at Sarah P. Duke Gardens in Durham, free and open to the public
- **June 11** (1:00 – 5:00) **Offsite Event**, Bethesda, Md. — NTP Interagency Center for the Evaluation of Alternative Toxicological Methods/Interagency Coordinating Committee on the Validation of Alternative Methods Town Meeting (NICEATM/ICCVAM)

- **June 12** (8:30 – 5:00) **Offsite Event**, Bethesda, Md. — Scientific Advisory Committee on Alternative Toxicological Methods (SACATM)
- **June 15** in Rodbell, 9:00 – 10:00 — Frontiers in Environmental Sciences Lecture Series featuring Howard McLeod, PharmD. (UNC), Topic TBA
- **June 15** in Rodbell A, 11:00 – 12:00 — Seminar on “The Confidentiality of Human Genetic Research” featuring Amy McGuire, J.D., Ph.D., (Center for Medical Ethics and Health Policy, Baylor College of Medicine)
- **June 19** in Executive Dining Room, 11:30 — Gay, Lesbian, Bisexual and Transgender Diversity Event, Brown Bag Lunch with a showing of the 1998 documentary, “Out of the Past: The Struggle for Gay and Lesbian Rights in America”
- **June 22** in Rodbell, 8:30 – 5:00 — NTP Board of Scientific Counselors Meeting
- **June 26** in Rodbell, 2:00 – 2:30 — Gay, Lesbian, Bisexual and Transgender Diversity Event, Speaker and Topic TBA
- **June 28** in Rall F193, 1:00 – 2:00 — LSB Seminar Series featuring Jason Williams, Ph.D., speaking on “The PMCF: A Mass Spectrometry Resource for DIR”
- **June 29** in Rodbell, 9:00 – 10:00 — Frontiers in Environmental Sciences Lecture Series, Speaker and Topic TBA
- **June 30** (8:00 pm) **Offsite Event** at Duke’s Baldwin Auditorium, East Campus in Durham — “Acts to Follow,” performances by thirty professional North Carolina choreographers and companies, free and open to the public

[Return to Table of Contents](#)



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