

Fall 2009

# UGAresearch

Discovery and Innovation at The University of Georgia



## UGA Takes on Global Diseases

A MAN OF THE PEOPLE • CHRONICLER OF DIVERSITY





## ugaresearch

is published by the Office of the Vice President for Research at the University of Georgia. The magazine is printed with funds from the University of Georgia Research Foundation, Inc., a nonprofit foundation that supports UGA research

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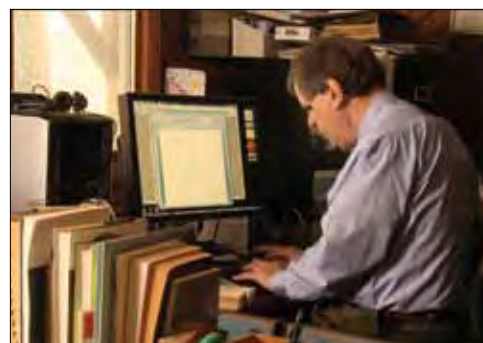
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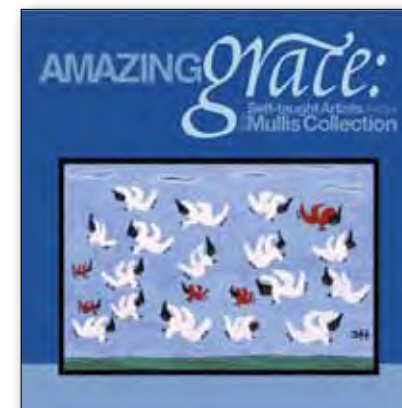






PHOTO BY ROBERT NEWCOMB/UGA

David Lee  
Vice President for Research

A major trend on American campuses in recent years has been “technology transfer”—that is, transferring the fruits of university-based research to the marketplace. These efforts include the patenting of new discoveries, their licensing to established companies, and the formation of “startup” companies that aim to commercialize the research directly.

Technology transfer has some real advantages to a university, both altruistic and self-serving. First, it ensures that the university’s research benefits society. Second, it allows our best and brightest researchers to market their discoveries and inventions. Third, technology-transfer activities provide valuable educational experiences for our students. Fourth, aided by the historic Bayh-Dole Act of 1980—which enables universities to benefit financially even when discoveries stem from research funded by the federal government—technology transfer can produce significant revenue streams. Finally, technology transfer helps build relationships with industry that further enhance the university’s research mission.

With technology-transfer activities, expertly pursued by the Technology Commercialization Office and the Georgia BioBusiness Center, UGA is especially successful in this arena; it is one of a relatively small number of universities that derive substantial earnings from technology licensing. In 2009, UGA earned a record \$30.5 million—an outstanding accomplishment. Indeed, UGA currently ranks among the top 20 U.S. universities and colleges on the basis of licensing income, most of which we reinvest in research activities that further prime our technology-discovery “engine.” Also, UGA has assisted in the startup of more than 100 companies to date, the vast majority of which are still active in Georgia.

Of course, with these benefits also come challenges. Most important, we must ensure that technology transfer does not compromise our primary mission as an educational institution. It is also important to recognize that universities, especially the public universities, have a very different role from that of the private sector. While income from technology transfer provides a welcome source of revenue, our primary concern is to ensure that UGA research serves the public at large. Sometimes these goals are in conflict. Maximizing societal impact may, in some cases, mean accepting little or no financial gain. Universities lack the resources to pursue the greatest rewards from some discoveries. For example, while pharmaceutical companies may spend up to a billion dollars to market a new drug that ultimately fails—consider the case of Vioxx—universities are not structured for such high-risk ventures. Thus, we typically license promising drugs at early stages of development, and sometimes must accept the tradeoff of a lower return than if we had tried to bring the drugs to market ourselves.

UGA supporters can be proud of the university’s successful record of technology transfer and our determination that research efforts improve the lives of Georgians and the global community. Whether producing new drought-resistant plant varieties, engineering more efficient processes for biofuels production, or developing better drugs for cancer, UGA is working not only for you but for future generations.

## Big step toward tiny biological “batteries”

By growing nanoscale wire brushes—built of the body’s own molecules—that conduct electrical charges, University of Georgia researchers have taken a first step toward developing biological fuel cells that could ultimately power pacemakers, cochlear implants, and prosthetic limbs. The journal *Chemical Science* called the technique “a significant breakthrough for nanotechnology.”

UGA chemist Jason Locklin and graduate students Nicholas Marshall and Kyle Sontag fabricated brushes made up of chains of thiophene and benzene molecules that ranged in thickness from 5 to 50 nanometers, too small to see even under a high-powered optical microscope.

“These molecular wires are actually polymer chains that have been grown from a metal surface at very high density,” said Locklin, who has a joint appointment with UGA’s Franklin College of Arts and Sciences and the Faculty of Engineering and is a member of the Nanoscale Science and Engineering Center. “The structure of the film resembles a toothbrush, where the chains of conjugated polymers are like the bristles. To get chains to pack tightly in extended conformations, they must be grown from the surface, a method we call the ‘grafting from’ approach.”

Using this approach, the scientists laid down a single layer of thiophene as the film’s initial coating, then built up chains of thiophene or benzene using a controlled polymerization technique. Their research, funded by the Petroleum Research Foundation, was

published in the June issue of *Chemical Communications*.

While a major goal is to develop bio-fuel cells that would replace the need for batteries in an implanted device, it’s difficult to harness the body’s own fuel sources. While enzymes, for example, do a good job of converting chemical energy into electrical energy, “they aren’t very useful in this application because they have natural protective insulating layers that prevent good electron transport from active site to electrode,” Locklin said. “Hopefully, our molecular wires will provide a better conduit for charges to flow.

“The beauty of organic semiconductors is how their properties change, based on size and the number of repeating units,” he said. Thiophene itself is an insulator, “but by linking many thiophene molecules together in a controlled fashion, the polymers have conducting properties.” Moreover, “because this technique allows us to systematically vary polymer architecture,” said Locklin, “it opens up the possibility for use in electronic devices such as sensors, transistors, and photovoltaics.”

There is a long way to go, however. While “flexible electronics” is a large and promising area of research, it is still in its infancy, Locklin said. “For example, we don’t yet understand all of the fundamental physics involved in how electrical charges move through organic materials.”

For more information contact Jason Locklin at: [jlocklin@chem.uga.edu](mailto:jlocklin@chem.uga.edu).

— Helen Fosgate





## Tropics produce more baby girls

Women who want to increase their chances of giving birth to a girl should live closer to the equator, according to a University of Georgia researcher.

Most animals' nominal birth ratios are 50:50 male/female, but the proportion can be influenced by environmental factors, said Kristen Navara, a reproductive endocrinologist in UGA's College of Agricultural and Environmental Sciences. Her research with hamsters and mice has shown that more males are born in winter, when days are shorter, while longer days favor females.

Spurred by her findings, Navara wanted to learn whether the same phenomenon holds true in humans. She dug through the CIA's World Factbook and other government publications, gathering data on 202 countries with a decade or more of uninterrupted birth statistics. She then analyzed the figures based on latitude, average temperature, day length, and socioeconomic status.

Her study, the first ever of global birth-sex ratios, showed that people living in areas with longer and darker winters—such as those in temperate and subarctic regions—have more baby boys, which accounted for 51.3 percent of total births.

In the tropics, only 51.1 percent of births were boys. Navara reported her findings in the April 2009 issue of *Biology Letters*.

Such a difference may seem small, but it can translate into significant numbers. In the Central African Republic, for example, 51 percent of births are to girls, making it the only country in the world to produce more girls than boys. In 2006, that percentage translated into 1,400 fewer boys than if the birth ratio had been 50:50. On average worldwide, 105 boys are born for every 100 girls (51.2 percent boys).

"I'm still not sure which cue affects the rates," Navara said, "but I suspect it's day length and, as a result, melatonin levels." She noted that people who live in temperate climates get fewer than eight hours of light during winter. As a result, their bodies produce more melatonin than those who live in the tropics, which have more daylight hours. Other tropical countries with lower male birth rates included Grenada (50.2 percent), Mauritius (50.3 percent), and the Bahamas (50.5 percent).

"Of the 20 countries with the lowest ratios, 18 were at tropical latitudes," said Navara. "This overarching pattern remained despite their enormous socioeconomic variations."

The biological trend was also unaffected by cultural factors. For example, because baby boys are favored over girls in some Asian and African cultures, the high rates of selective abortion and infanticide there have skewed the overall sex ratio toward males. "We eliminated Asian and African countries in a second round of analyses to eliminate sex-specific abortion factors," said Navara. "But even then, the trend of women who live nearer the equator giving birth to more girls was still significant."

For more information contact Kristen Navara at: [knavaara@uga.edu](mailto:knavaara@uga.edu)

—April Sorrow

## Genome sequence can help tap sorghum's potential

Southerners may best know sorghum as a sweet, biscuit-topping syrup. But the grain's uses range from dependable drought-tolerant food crop to biofuel source, says a University of Georgia researcher who led a team that recently sequenced the plant's genome.

"Sorghum's importance is enormous," said Andrew Paterson, a distinguished research professor and director of the Plant Genome Mapping Laboratory (a joint unit of UGA's College of Agricultural and Environmental Sciences and Franklin College of Arts and Sciences). He and his collaborators mapped and analyzed the genome of sorghum bicolor, placing 98 percent of its genes in their chromosomal context. At 730 million bases, or letters of DNA, sorghum has a genetic code one-quarter the size of the human genome.

The results of the research were published in the January 2009 issue of *Nature*, with Paterson as lead author among a total of 45 coauthors—some from the University of Georgia and others from institutions as close as South Carolina and as far away as

Germany, Pakistan, and India.

The crop-variety sorghum that Paterson and colleagues studied is drought-tolerant, but its wild cousins can survive on even less water and resist more diseases and pests. Thus breeders can use the sequence as a tool for blending desirable traits into improved commercial plants.

The sequenced sorghum genome can also be used to improve biofuel crops such as sugarcane and *Miscanthus*, a genus of 15 species of perennial grasses that is a leading biofuel crop in Europe. These plants have much larger and more complicated genomes than sorghum, but it is a close relative that can help guide their improvement.

Sorghum itself is used to make biofuel, and it is currently the number-two source of fuel ethanol in the United States (corn is first). And even though a shift is taking place from the seed-based biofuel produced today to cellulose-based production, this is a process for which sorghum shows great promise. That is one major reason why the U.S. Department

of Energy's Joint Genome Institute got involved with sorghum sequencing.

The sorghum genome sequence can also have other uses. Given that sorghum's cousin Johnson grass is one of the world's most notorious weeds, Paterson hopes that by using the sequence researchers will find better ways of controlling it.

Sorghum is only the second grass genome that has been sequenced, after rice. While the two grasses are similar—93 percent of the genes present in sorghum are also found in rice—the differences are important enough to warrant closer inspection. For example, Paterson's team discovered that sorghum's seed-protein genes are completely different from their counterparts in rice. But they don't know how and why.

"Sorghum's genes don't just stand out and say, 'Here I am. This is why I'm different from rice,'" Paterson said. "So we have a lot of new questions to answer."

For more information contact Andrew Paterson at: [paterson@uga.edu](mailto:paterson@uga.edu).

—Stephanie Schuppska





## Sea life in the most inhospitable places

**A** newly published study by a University of Georgia biogeochemist and her colleagues has shown, for the first time, distinct patterns of microbial metabolism where fluids emanating from the seafloor, whether from mud volcanoes or brine pools, mix with the overlying seawater.

"Very few results describing rates of microbial activity in seafloor brines have been published, and none have shown the detailed stratification of microbial processes within the brine fluids documented here," said Samantha Joye, a professor of marine sciences in UGA's Franklin College of Arts and Sciences.

The research, focused on emissions from mud volcanoes and brine pools at depths of about 600 meters beneath the Gulf of Mexico, has implications for understanding life processes on early Earth and potentially for determining whether moons in our solar system, such as Jupiter's Europa, might support microbiological life. It was published in the April 2009 issue of *Nature Geosciences*.

Undersea mud volcanoes can be quite active, with plumes of bubbling

gas, mainly methane, extending hundreds of meters along the seafloor. Brine pools form in depressions in the largely flat ocean bottom where warm salty fluids migrate up through the sediments, and because brine is much denser than seawater, it pools on the bottom's surface after cooling. Brine pools are less active than mud volcanoes, but they can be quite expansive too—and "hypersaline." At places where seepage is active, brine fluids with four or five times as much salt as seawater will escape.

One reason why little has previously been known about undersea mud volcanoes and brine pools was their sheer inaccessibility. Joye and her team had at their disposal a modern tool—the Johnson Sea Link, a deep-sea scientific research submersible built by the Harbor Branch Oceanographic Institution—to study the features on the ocean floor.

Her team examined "slices" of water above a mud volcano and a brine pool with an eye to understanding how microbial processes change in their water columns. While both areas were anoxic

(depleted of dissolved oxygen) and hypersaline, and thus inhospitable for most life, microorganisms thrived there. The researchers documented differences in the depth distribution and magnitudes of key microbial processes. "We believe the composition of the microbial communities and their metabolism are linked to differences in geochemical and flow differences between the sites," said Joye.

The team also found that microbial activity was measurable in the deepest samples collected, so it is feasible that active microbes could extend well into the subsurface of the mud volcano systems in the Gulf of Mexico.

The work was supported by grants from the National Science Foundation, the National Oceanic and Atmospheric Administration, the Department of Energy, the American Chemical Society, the Environmental Protection Agency, and NASA.

For more information, contact Samantha Joye at [mjoye@uga.edu](mailto:mjoye@uga.edu).

— Philip Lee Williams

## Lower drinking age increases unplanned pregnancies, premature births

**A** new University of Georgia study finds that lower legal drinking ages raise the incidence of risky sexual behavior, unplanned pregnancies, and premature births among young people. "There are consequences beyond more traffic fatalities," said economist Angela Fertig, an assistant professor in UGA's College of Public Health.

Fertig, who is also a public service assistant in the university's Carl Vinson Institute of Government, performed the study in collaboration with Tara Watson, assistant professor of economics at Williams College in Massachusetts. Their results appeared in the May 2009 issue of the *Journal of Health Economics*.

Fertig said the consensus among researchers had long been that a higher minimum drinking age reduces fatal car crashes and alcohol consumption among young adults, but there was little data about how drinking-age laws influenced the health of infants born to young mothers. Thus she and Watson examined birth records and survey data on alcohol use for the years 1978 to 1988, a period when state drinking-age laws were in flux. They found that a legal drinking age of 18:

- Increased alcohol consumption among 18- to 20-year-old women by 21 percent
- Increased the number of births to 18- to 20-year olds by 4.6 percent in white women and 3.9 percent in African-American women
- Increased the likelihood of women under age 21 having a low-birthweight baby by 6 percent
- Increased the likelihood of premature birth among women under 18 by 5 percent among white women and 7 percent among African-American women

Such statistics clearly reveal that in many cases the impacts of a lower drinking age fall disproportionately on African-Americans, said Fertig. For example, researchers found that a drinking age of 18 increases the probability of an unplanned pregnancy by 25 percent among young African-American women.

Moreover, the analysis showed that poorer infant-health outcomes associated with a lower drinking age weren't necessarily a direct result of pregnant women's alcohol consumption but often a consequence of the pregnancies being unplanned. "Teenagers who get pregnant unexpectedly are less likely to receive good prenatal care, and they may not take as much interest in the child as someone who tried to get pregnant," Fertig explained.

Last year the Amethyst Initiative, a group of more than 100 college and university presidents and chancellors, issued a statement that encouraged discussion about lowering the legal drinking age. Fertig said her study's findings should certainly broaden the debate.

For more information, contact Angela Fertig at: [afertig@uga.edu](mailto:afertig@uga.edu).

— Sam Fabmy







## UGA researchers study when heat risks rise for prep football players

When schools started in August, University of Georgia kinesiology researchers launched a new study of 2,500 football players at 25 high schools across the state to collect data to help administrators and coaches set effective heat-related policies nationwide and, hopefully, save lives.

Since 1995, 39 high school football players have died from heat-related injuries, according to the National Center for Catastrophic Sports Injury Research at the University of North Carolina. In 2003, the National Collegiate Athletic Association enacted heat-related football practice restrictions during August. However, no such guidelines exist across interscholastic football.

In response to the frequency of heat-related deaths, the Georgia High Schools Association (GHSA) mandated that all schools develop a written policy for practice in extreme weather conditions, recommending the use of heat index rating or wet bulb globe temperature (WBGT), to determine whether or not practices should be held or modified.

Many schools are struggling to develop a policy. It's difficult because there is limited data about the relationship between sport participation in various weather conditions and the risk of heat-related illness, said Mike Ferrara, a professor of kinesiology and director of the athletic training education program in UGA's College of Education.

"Some schools have used the American College of Sports Medicine guidelines; others have adopted an unpublished heat index scale, and a few have developed their own guidelines using a heat index," said Ferrara. "The problem is knowing exactly what the risk is when practicing in extreme environmental conditions, and how it applies to the adolescent athlete. We have seen some very conservative policies while others have allowed practice to continue in extreme heat conditions."

The issue got more attention after the death last year of a Kentucky high school football player from exertional heat stroke. The coach was charged with reckless homicide and indicted by a grand jury, meaning he should have stopped players from running "gassers" after one player collapsed. The coach pleaded not guilty and was eventually acquitted.

Ferrara and Cooper began their three-year study in August to measure WBGT—a measure of humidity, integrated effects of radiation and wind, and ambient air temperature combined into a formula to give a WBGT reading, recognized as the "gold standard" for measuring environmental conditions. They will correlate those figures to the rate of exertional heat illnesses (EHIs) to determine risk levels. The study is being funded by a \$150,000 grant from the National Athletic Trainers' Association Research and Education Foundation, GHSA, Georgia Athletic Trainers Association, and the National Federation of State High Schools Foundation.

For more information, contact Mike Ferrara at: [mferrara@uga.edu](mailto:mferrara@uga.edu).

— Michael Childs



## Genetically engineered trees could restore devastated American chestnut

The American chestnut once thrived from New England to the Southern Appalachians. It was a fast-growing tree used in construction, and leather-making—and it produced a large and dependable nut crop for wildlife and humans alike.

In their prime, the trees stood a hundred feet tall. But in the 1880s, Americans began to import Asian chestnuts to plant in their yards, and with these trees came the fungus that attacked the native trees. The fungus swept down the East Coast, virtually wiping out the stately hardwoods. Today, American chestnuts typically grow no taller than 6 feet before succumbing to the blight.

But researchers in UGA's Warnell School of Forestry and Natural Resources, with support from ArborGen LLC, a leader in tree improvement and commercial production, have developed a method for inserting anti-fungal genes into the tree's DNA. They hope the new genes will fight off the fungal disease well enough to one day restore the American chestnut to its rightful place in Eastern forests.

Scott Merkle, professor of forest biotechnology, has been working on the problem for more than 20 years. He and colleagues Gisele Andrade and Joe Nairn describe the system they developed in a paper published in the journal *Plant Cell Reports*.

The first documented instance of what became a widespread blight occurred in what is now the Bronx Zoo. A forester noticed that the American chestnuts planted along the streets were dying. By 1904, the fungus had been identified as *Endothia parasitica* (eventually renamed *Cryphonectria parasitica*), but it was too late: The blight spread south rapidly, infecting Georgian trees by the 1940s.

The disease attacks the chestnut where the bark has been injured, killing the inner bark layer and eventually girdling the tree so that food and water cannot move up or down the stem. Merkle said that while a handful of larger chestnuts have been found in isolated areas, most succumb to the blight as saplings no larger than shrubs.

For more information contact Scott Merkle at: [merkle@warnell.uga.edu](mailto:merkle@warnell.uga.edu).

— Sandi Martin



## MULTI-MEDIA

### *Inside Stories: Hugh Ruppersburg*

Produced by the Willson Center for Humanities and Arts, the Honors Program and the Center for Teaching and Learning (Research Channel, 2008)

[www.isd.uga.edu/multimedia/insidestories.html](http://www.isd.uga.edu/multimedia/insidestories.html)

[www.researchchannel.org/prog/displayevent.aspx?rid=27447](http://www.researchchannel.org/prog/displayevent.aspx?rid=27447)

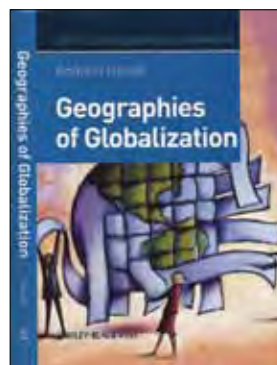
Honors student Aqsa Mahmud and Betty Jean Craige, University Professor of Comparative Literature and director of the Willson Center for Humanities and Arts, interview Hugh Ruppersburg, senior associate dean of the Franklin College of Arts and Sciences and professor of English, about Georgia and Southern literature.



### *Amazing Grace: Self-Taught Artists from the Mullis Collection*

Paul Manoguerra, curator of American art, Georgia Museum of Art (Georgia Museum of Art, 2007)

This hardcover 12-by-12-inch exhibition catalogue features full-page color illustrations of 90 works from a 2007 exhibition organized by Manoguerra, as well as essays by Carl Mullis, the collector, and Carol Crown, professor of art history at the University of Memphis, notes on the works and short biographies of the 60 artists featured in the exhibition.



### *Geographies of Globalization: A Critical Introduction*

Andrew Herod, professor of geography and director, UGA Paris Study Abroad Program (Wiley-Blackwell, 2009)

Herod shows how actors as varied as transnational corporations, national governments, and labor unions are reworking the geographical connections between different places as part of the processes called “globalization.”



### *5 Steps to Expert: How to Go from Business Novice to Elite Performer*

Paul G. Schempp, professor of kinesiology, College of Education (Davies-Black® Publishing, 2008)

What does it take to reach peak performance? Schempp, who has designed performance programs for business and sports organizations, lists specific techniques and exercises that anyone can use to develop mastery over a subject or skill.



### *Creating Welcoming Schools: A Practical Guide to Home-School Partnerships with Diverse Families*

JoBeth Allen, professor of language and literacy education, College of Education (Teachers College Press and International Reading Association, 2007)

Allen shows how teachers, parents, and administrators in districts comprised of disparate communities can develop supportive partnerships that enhance student learning.



### *Strawberry Plains Audubon Center: Four Centuries of a Mississippi Landscape*

Hubert H. McAlexander, Josiah Meigs Professor of English (University Press of Mississippi, 2008)

McAlexander, recipient of a 2002 UGA Creative Research Medal, here documents the multigenerational history of 2,500 acres in north Mississippi that became one of the largest Audubon sanctuaries in the United States.

Send suggestions for Media Shelf of work by UGA personnel to  
Laurie Anderson, [laurie@uga.edu](mailto:laurie@uga.edu).

## RESEARCH TOOLS

### *Georgia County Facts and Figures*

developed by Douglas Bachtel, professor of housing and consumer economics  
[www.fcs.uga.edu/hace/gafacts/](http://www.fcs.uga.edu/hace/gafacts/)

This site, sponsored by the College of Family and Consumer Sciences and the Housing and Demographics Research Center, features an interactive map with extensive data on Georgia's 159 counties, and links to other demographic data sources.



### *Teaching PR*

Karen Miller Russell, associate professor of public relations and media history, Grady College of Journalism and Mass Communications  
[www.teachingpr.org/](http://www.teachingpr.org/)

Russell, who edits the *Journal of Public Relations Research*, monitors and comments on the growing use of social media and its application (and misapplication) in public relations practice and education.



## AUDIO

### *Emergence*

Athens Guitar Trio  
(Independent release, 2008)  
[www.athensguitartrio.com/music.htm](http://www.athensguitartrio.com/music.htm)

Students Rylan Smith, Dusty Woodruff and Matt Anderson's first album presents elegant interpretations of works arranged and written for the classical guitar trio. “An excellent debut from this young ensemble,” enthused Soundboard Magazine. Hear sample tracks at the link above.



### *Millennium Canons*

University of Georgia Wind Ensemble conducted by John P. Lynch, director of bands and professor of music (Naxos, 2009)



This anthology of compositions by various 20th and 21st century artists showcases the broad range of modern wind band music, from contemplative to exuberant, including the colorful work “Lost Gulch Lookout” by Kristin Kuster commissioned by conductor Lynch and The University of Georgia.





# UGA Takes On Global Diseases

Renowned University of Georgia scientists collaborate with researchers and practitioners in academia, government, and industry to prevent and treat a wide range of infectious diseases.

By Charles Seabrook

Somewhere in the world, perhaps a place near you, a once-harmless virus, bacterium, or fungus may be undergoing a genetic makeover in an animal's gut, transforming into an infectious pathogen capable of causing illness, disability, or even death. The new germ might spread quickly to other animals, and then to people who come into contact with the infected creatures. In short order, it could be spreading globally human-to-human.

Since 1975, the world has seen the emergence of HIV, mad cow disease, Lyme disease, severe acute respiratory syndrome (SARS), avian influenza, Ebola virus, West Nile virus, and other infectious maladies, most of which originated in just such a manner. A joint statement last year from five prominent University of Georgia scientists summed up the threat: "More than 30 infectious diseases have emerged or re-emerged over the last three decades. Most come from other animals, and many, such as HIV and SARS, have spread worldwide. There is every indication this pattern will increase in the foreseeable future and be a significant burden to global economies and public health."

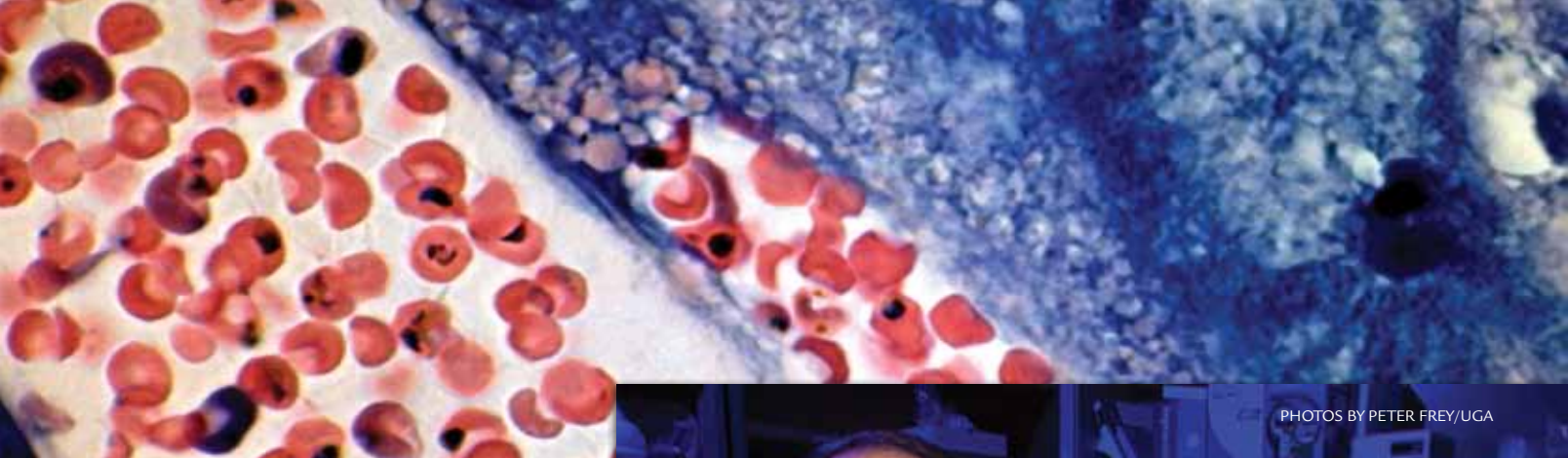
To stave off such possibilities, and to corral infectious diseases already plaguing society, effective new tools—including vaccines, therapeutic drugs, and diagnostic techniques—are urgently needed, the scientists say. Thus several leading institutions around the world, including the University of Georgia, are investing considerable time, money, and energy to develop new countermeasures against infectious illnesses.

Already ensconced at UGA is the interdisciplinary Center for Tropical and Emerging Global Diseases, established in 1998 to foster research, education, and service in its subject areas. More recently, UGA opened the Animal Health Research Center, which is a state-of-the-art biocontainment facility for the study of infectious microbes. The university has redeployed a campus complex, Riverbend South, as an infectious-disease research facility, and it has recruited several world-renowned experts in associated fields.

School children in western Kenya, where more than half of children have schistosomiasis.

PHOTO COURTESY OF DAN COLLEY



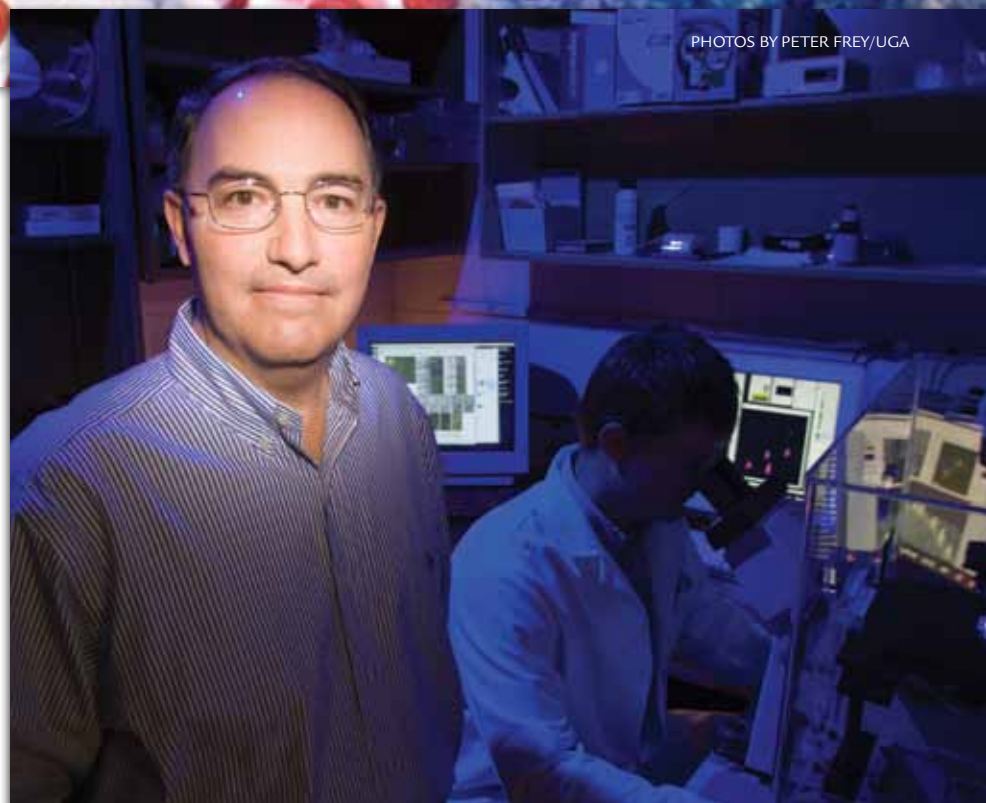


## A Constellation of Colaborations

The heart of UGA's efforts is its Faculty of Infectious Diseases, an initiative of the Office of the Vice President for Research. Launched two years ago, the Faculty's roster now includes some 90 professors from 20 departments—in disciplines that include agriculture, microbiology, immunology, genetics, chemistry, cell biology, veterinary medicine, ecology, pharmacy, and public health—with each individual having expertise to help slow the spread of infectious disease. This multidisciplinary approach is aimed at encouraging scientific collaboration and stimulating the rapid application of findings to serve the patient's needs, said Duncan Krause, director of the Faculty of Infectious Diseases.

Collaboration is taking place not only among scientists within the University of Georgia but also between UGA and researchers at private companies and other institutions, including Georgia Tech, Emory University, and the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta. UGA and CDC recently announced one such collaboration. They are teaming up to conduct joint studies on several infectious diseases, including rabies, malaria, tick-borne illnesses, avian influenza, and measles. Researchers will focus on understanding the biology of the infectious agents to gain insights about how to better control them.

In another collaboration, with Alnylam Pharmaceuticals in Cambridge, Mass., Ralph Tripp and his colleagues in UGA's College of Veterinary Medicine are using RNA interference—which helps to control which genes in a living cell are active and how active they are—to attack viruses. These researchers believe that they are closing in on a new class of drugs to treat the flu, as well as a broad range of other viruses, and that the drugs could be ready for initial testing within a year.



Duncan Krause (above) is director of UGA's Faculty of Infectious Diseases.

"Influenza is of interest to our research program, as this is a dynamic virus, constantly evolving and requiring new vaccines and therapeutic strategies," said Tripp, formerly chief of CDC's Respiratory and Enteric Viruses Unit. He conducts his research at UGA's 75,000-square-foot Animal Health Research Center, the only non-federal laboratory capable of conducting research with high-containment pathogens both on small and large animals.

In collaboration with Emory, UGA is on the front line in the battle against the H1N1 flu strain, the so-called "swine flu," which emerged from Mexico last April and is now causing widespread outbreaks. UGA scientists are trying to discover how the flu strain is transmitted between animals, how it infects human airway

cells, and how quickly it might mutate. The researchers also are working with scientists in UGA's Nanoscale Science and Engineering Center to develop diagnostic tests to distinguish H1N1 from other flu virus strains.

Another UGA/Emory alliance is the Influenza Pathogenesis and Immunology Research Center—aimed at studying flu transmission and intervention strategies for H5N1 and novel H1N1 viruses. In that collaboration, lab scientists at UGA's Animal Health Research Center are interacting directly with Emory researchers who are doing clinical studies. "The work we do in the lab is designed to translate to the clinic," said Tripp, "and success in disease prevention in humans constitutes a level of validation for our efforts in the lab."

PHOTOS BY PETER FREY/UGA



PHOTO BY ANDREW TUCKER/UGA

## A 'One Health' Approach

Because flu and many other infectious pathogens can jump between livestock, wildlife, and humans, many scientists—including those at UGA—are urging a "One World, One Health" approach to surveillance. The One Health Initiative is a worldwide strategy to integrate the knowledge and efforts of researchers, doctors, veterinarians, and allied health care professionals in monitoring and defending the health of all species.

The approach calls for combined conferences, journal articles, and seminars among these professionals—and joint efforts to develop new diagnostic methods and vaccines. But in the United States at least, the effort is complicated by a shortage of veterinarians—and in Georgia—by a shortage of doctors as well.

"Vet Med has long been a proponent of the 'One World—One Medicine—One Health' concept, which includes the environment as an integral component of human and animal health," said Harry Dickerson, associate dean in UGA's College of Veterinary Medicine. "This holistic approach is critical to understanding not only the mechanisms of infectious diseases and the interactions among host species and pathogens, but also to reducing the impact of infectious agents. UGA is a national leader in this effort, having made major investments in the strategic hire of scientists and research laboratory infrastructure."

A study published in the June 2009 issue of *Nature*, illustrates the need for such an approach. Its authors followed the transfer of genes among pigs and birds that resulted in the human flu pandemic. Despite the widespread surveillance of influenza in humans, the scientists showed that the lack of systematic monitoring in swine allowed the strain to evolve unchecked over many years.

For more information visit:  
[www.onehealthinitiative.com](http://www.onehealthinitiative.com)

—Helen Fosgate

Harry Dickerson (above, right), associate dean in the College of Veterinary Medicine.

Ai Tsuiiki (right), a 2008 Georgia Veterinary Scholar, works in the lab.



PHOTO BY SUE MEYERS SMITH



## With Benefits for All

Some people inevitably question why state-supported universities like UGA are putting so much time and effort into conquering parasitic diseases that are viewed mostly as problems of developing countries. Shouldn't our limited resources, they ask, be devoted to improving the health of people in this country?

The answer is that these efforts at UGA and other institutions most certainly will benefit Americans. It is in the interest of the United States to help control infectious diseases around the world, and not purely for humanitarian reasons.

"The world is smaller today, and what we consider our backyard has expanded considerably," notes Duncan Krause, director of UGA's Faculty of Infectious Diseases. "In the global

economy, we share the economic burden of emerging infectious diseases—here and elsewhere on the planet."

Newly emerging and re-emerging infectious diseases—most of them originating outside this country—kill at least 170,000 Americans annually, according to the National Intelligence Council. Not only do such diseases pose a health threat, they also compromise U.S. security, according to a council report. "These diseases will endanger U.S. citizens at home and abroad, threaten U.S. armed forces deployed overseas, and exacerbate social and political instability in key countries and regions in which the United States has significant interests."

—Helen Fosgate

**Pauline Mwinzi, (below left) a PhD who now works as a Wellcome Trust research fellow, looks for infected snails at the edge of Kenya's Lake Victoria. Men from the nearby village, Usoma, harvest sand from the lake bottom to sell for making concrete. They are exposed to infection by schistosomes as they stand waist deep in the water for 5 or 6 hours a day.**

PHOTO COURTESY OF DAN COLLEY



## Fielding the A-Team

Influenza is but one item on a long list of global public enemies against which UGA scientists are mounting a full-court press. Some, like flu, are household names—malaria, AIDS, tuberculosis. Others are so strange-sounding that TV commentators often have trouble pronouncing them—schistosomiasis, leishmaniasis, lymphatic filariasis, trypanosomiasis (Chagas disease). Regardless of their names, these maladies directly affect hundreds of millions of people every year.

Internationally, infectious diseases are the leading killer andcrippler of children and adolescents. Chagas disease alone, resulting from a blood-borne parasite spread by insects, is the single most common cause of congestive heart failure in the world. It is also the leading cause of death among young to middle-aged adults in endemic areas of South America, said UGA infectious disease scientist Rick Tarleton, a leading authority on Chagas. Unfortunately, "there are no vaccines to prevent it and current therapeutic drugs are of limited efficacy," he said. Therefore much of his work focuses on overcoming these limitations.

Similarly, Dan Colley, director of UGA's Center for Tropical and Emerging Global Diseases (CTEGD) and an expert on schistosomiasis, has researched this disease for decades. Caused by a parasitic flatworm spread by freshwater snails, schistosomiasis affects more than 200 million people in Africa, Asia, and the Americas. The disease, which can be life-threatening, damages internal organs and impairs physical and cognitive development in children.

Largely because of immunologist Colley's international stature in schistosomiasis, the Bill and Melinda Gates Foundation awarded \$18.7 million to the UGA Research Foundation last winter to develop and evaluate research-based approaches and diagnostic tools to identify, control and, where feasible, even eliminate the disease. It was the largest medical research grant in the university's history and its third largest overall.

Colley, the grant's principal investigator, came to UGA eight years ago after serving as chief of CDC's Parasitic Disease Division, where he oversaw investigations into a number of disease outbreaks. "I wanted to get back into academics, and UGA's strength in parasitology appealed to me," he said. As CTGED director, Colley wants to foster an environment in which lab scientists talk regularly with public health researchers

who work in the developing countries where the diseases are endemic. Seven CTGED faculty members, he noted, work on projects overseas.

Chris Whalen, professor of epidemiology in UGA's College of Public Health, sees himself as a bridge between lab scientists and public health researchers. A renowned expert on tuberculosis, Whalen is an M.D. who early on turned to epidemiology, the study of the spread of diseases. He has spent much of the past 20 years in Uganda, where tuberculosis and HIV infections are rampant and where each infection exacerbates the incidence and severity of the other. Over the years, Whalen has established strong clinical research ties with Ugandan public health researchers to address the urgent issues of TB and HIV in the African nation. "Our program has been less bench science and more of an operational one," he said. "We look at how to take a discovery from the lab or a clinical trial and apply it to affect people's lives, rather than simply filling the pages of a scientific journal."

One way to meet this objective, said Whalen, is to train people to seek and employ the best disease-fighting tools. In that spirit, the Fogarty International Center of the National Institutes of Health has awarded Whalen \$1.1 million to help train Ugandan scientists in public health research. The program will focus on the need to improve preventive, diagnostic, and therapeutic services for HIV and TB in Uganda and throughout Africa. "It will bring Ugandan scientists to UGA for both degree and non-degree training programs, allowing them to study with world-class researchers and scientists," said Whalen.



Dan Colley



Rick Tarleton

PHOTO BELOW BY PAUL EFLAND/UGA

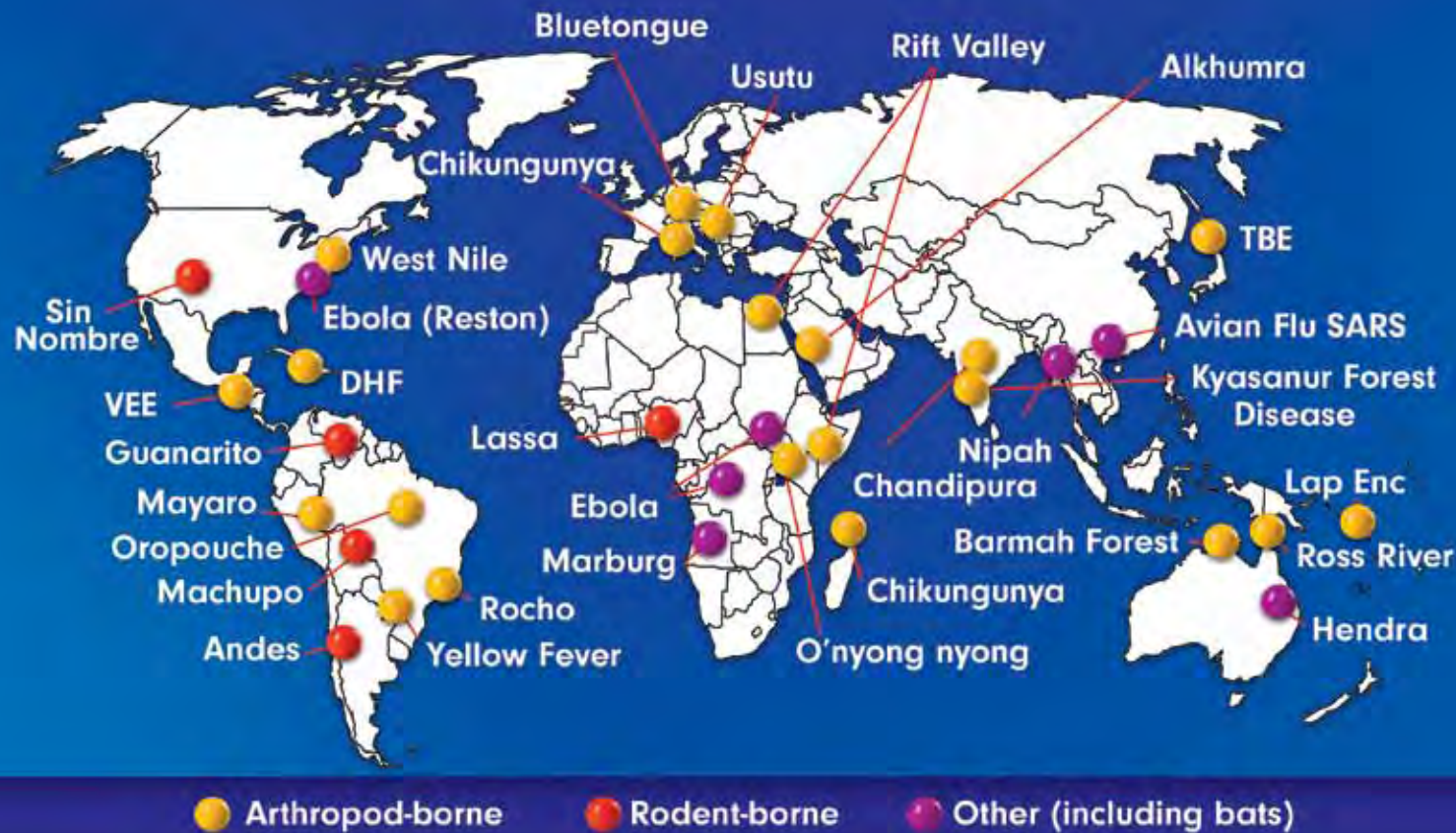
**Chris Whalen (below left) professor of epidemiology and M.D., reviews study data with Ugandan collaborator Juliet Sekandi.**





# Emerging and re-emerging infectious diseases

70% vector-borne or zoonotic



## Nipping It in the Bud

Infectious diseases are not just a looming threat to humans—they also pose an ever-present danger to animals, both wild and domesticated, whether they harbored the initial infection or not. The recently emerged chytrid fungus, known simply as Bd, is causing mass mortality among frogs in Latin America. Another fast-spreading fungus is killing bats throughout the United States. And scientists warn that infectious diseases represent tremendous risks to hogs, cattle, poultry, and other livestock, as well as to the national economy. The U.S. Department of Agriculture estimates that an outbreak of foot and mouth disease in the U.S. livestock industry could cost more than \$20 billion over 15 years in added consumer costs, reduced livestock productivity, and restricted trade.

Chances are good that what infects animals will cross over to humans, with the process being expedited by climate change, rapid travel, and drug-resistant microbes. A

study in the journal *Nature* last year by John Gittleman, dean of UGA's Odum School of Ecology, and his colleagues showed that 61 percent of new human diseases start in animals, mostly wildlife. For example, avian flu comes from birds. SARS, which appeared in 2003, likely originated in bats. And HIV probably jumped to African hunters who butchered and ate infected chimpanzees, according to the most prevalent theory.

UGA's College of Veterinary Medicine, having excelled in animal disease research for years, is now focusing on diseases that migrate from animals to humans. In its influenza studies, for instance, vet-school researchers are trying to discover the genetic factors that allow such spread, how the viruses change as they move through different species, and how they cause disease in each affected organism.

Now the critical question is: Where will the next big global infectious disease emerge?

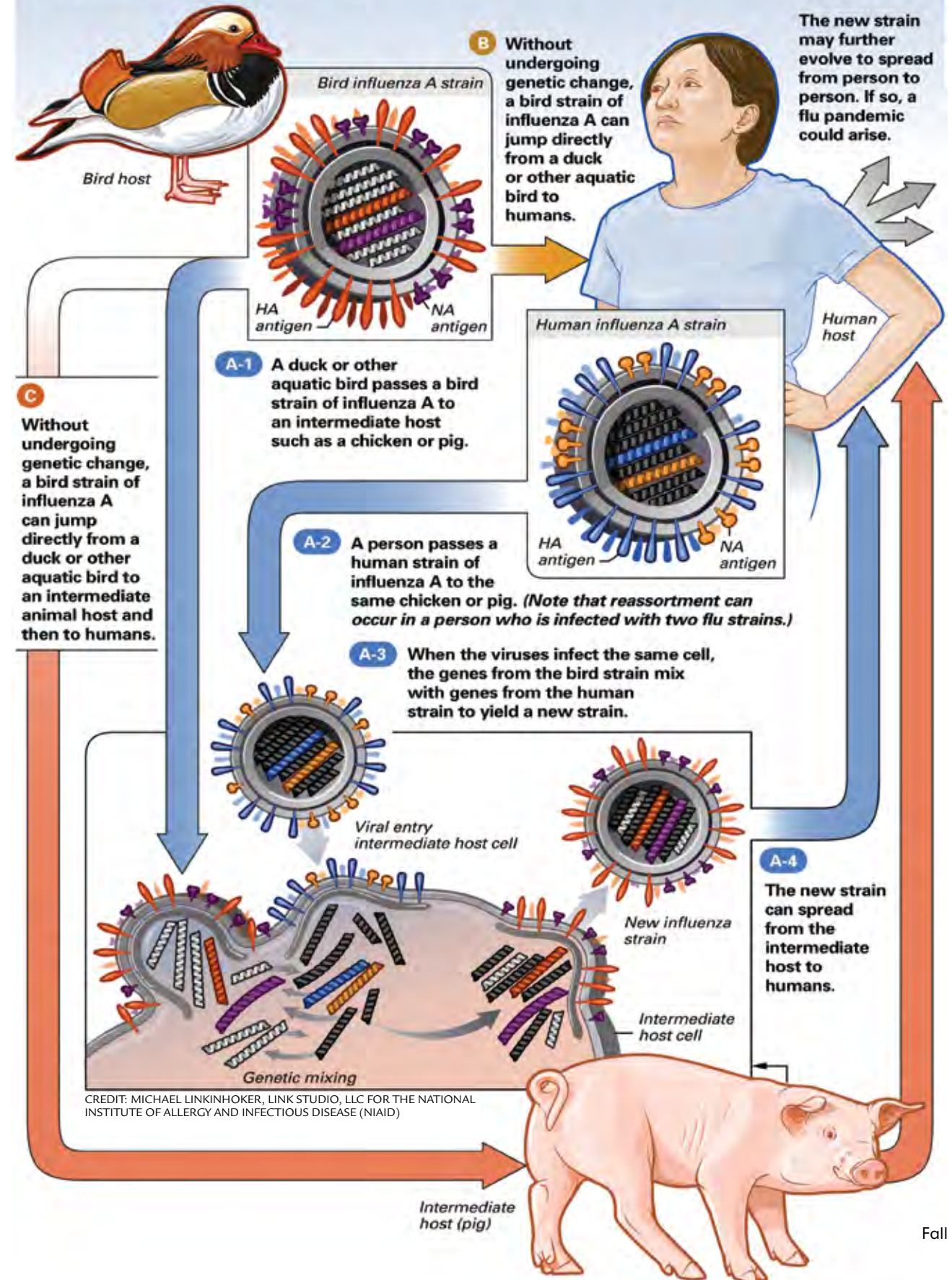
Gittleman and his colleagues believe their research may provide an answer. Using sophisticated computer models, public health data, wildlife studies, and population data to design a global map of emerging-disease "hotspots," they conclude that the next big one will most likely come from the tropics, regions rich in wildlife species and under increasing human pressure. The early detection of a new disease there will greatly enhance the chances of nipping it in the bud.

"This is a seminal moment in how we study emerging diseases," Gittleman observed. "Our research has shown that bringing ecological sciences and public health together can advance these fields in a dramatic way."

(Charles Seabrook is a retired science writer for the *Atlanta Journal-Constitution*. He wrote about oceans and climate change in the fall 2008 issue of *uga research*).

## How flu moves between species

The genetic change that enables a flu strain to jump from one animal species to another, including humans, is called "ANTIGENIC SHIFT." Antigenic shift can happen in three ways:



CREDIT: MICHAEL LINKINHOKER, LINK STUDIO, LLC FOR THE NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASE (NIAID)



# A Man of the People

*Andy Herod, a “labor geographer,” studies the lay of the land through the lot of its workers.*

*By Rebecca McCarthy*

Geography and landscape have fascinated Andrew Herod since he was a child growing up in Radlett, England, which sits on the edge of a greenbelt just 20 minutes from central London. He would observe the local stone walls and furrowed fields and speculate about what the countryside was like 800 or so years ago. Often he would uncover records that actually documented the landscape’s historical changes, not only physical but also cultural.

“I liked thinking about the people whose names had been forgotten,” said Herod. “And I enjoyed seeing how their political and social relationships played out to shape the landscape, like those between peasants and landlords.” He still does.

Since arriving at UGA in 1992, Herod has developed a novel realm of study. From Sydney, Australia, to Vancouver, London, and Chapel Hill, he is known in academic circles as a founder of “labor geography,” said colleague Jamie Peck, an eminent geographer at the University of British Columbia. Instead of following the longstanding traditions of economic geography, which tended to look primarily at firms and the effects of their actions, such as plant relocations, on the economic landscape, Herod focuses on workers and labor unions. From this fundamental level “he takes on the big questions relating to political-economic orthodoxy—and they don’t come much bigger than the question of globalization—in a way that works tenaciously across the grain of conventional thinking,” said Peck.

“CEOs, presidents, and prime ministers are important, but so are the nameless people who do the work,” said Herod. “Through their political struggles, ordinary people help create economic landscapes; it’s not all done by the heads of huge corporations or even by the heads of state.”

In the 1960s and ’70s, research in human geography meant crunching numbers, Herod said. Since then, geographers have begun to use the methods of historians and sociologists. Beyond maps and census data, Herod also pores over archival materials such as court documents, government reports, and labor union memos. He interviews corporate executives, union leaders, and rank-and-file union members to learn “why they did things in certain ways and what effect that had on the economic landscape.” Basically, he said, “I like to talk to people.”



Herod developed a new area of study, “labor geography,” that looks primarily at workers and unions rather than economics and industries.



**// I grew up with the sense that public service was important, and I wanted to help my community. //**

## A Passion for Social Justice

And Herod clearly has a way with people. His humor and generosity, among other engaging traits, have endeared him to students and colleagues at UGA and beyond—including his fellow officials on the Athens-Clarke County Commission, where he has served a local district since 2007 (see sidebar next page). Given Herod's down-to-earth manner, few would suspect he's a celebrated geographer making waves around the world.

Primarily for his research on globalization, Herod received a 2008 Creative Research Award from the UGA Research Foundation. Also in 2008, the Southeast Division of the Association of American Geographers presented him with its Outstanding Research Honors Award for his work on labor. "Before Andy, the discipline was quite naive about labor and workers," said Derek Alderman, associate professor of geography at East Carolina University and president of the association's southeast division. "He encouraged people to look at how labor unions organize space and how workers function as economic, social, and political agents. Before that, labor was just another factor," considered no more a political or geographical actor than the cost of land or energy.

The award, added Alderman, also recognized Herod's willingness "to give marginalized groups a voice," especially those being buffeted by changes wrought through globalization. Such groups might include janitors disenfranchised by multinational cleaning companies, receptionists in call centers, longshoremen coping with changes in technology, or poultry workers struggling to gain a foothold in another country—the very same kinds of folks who piqued Herod's interest as a boy reading British history.

Herod's passion for social justice and equality was cultivated in part by his maternal grandfather, the late Dai Davies. Herod both admired and adored his grandfather, who was a tinplate worker from Ebbw Vale in South Wales. Although he left school at age 14 to go to work, Davies became General Secretary of Great Britain's Iron and Steel Trades Confederation (ISTC)—the equivalent, said Herod, of being the national president of the U.S. Steelworkers' union. Davies later became treasurer of Britain's Labour Party, among other prominent and influential worker-oriented positions, and was knighted by the Queen in 1973 for his services. Herod remembers as a kid watching his "Pop" being interviewed on political talk shows.

**Herod was greatly influenced by his grandfather, the late Dai Davies, depicted in this caricature by Ralph Sallon, one of Britain's most distinguished political cartoonists. Davies served as General Secretary of Great Britain's Iron and Steel Trades Confederation – and later as treasurer of the Labour Party. He was knighted by the Queen in 1973 for service to his country and kinsmen.**



## Civic Engagement

Andy Herod had already served as president of his neighborhood association and as president of the Athens-Clarke County Federation of Neighborhoods. He'd been on the local planning body and on the county hearings board. So when the county commissioner from his district abruptly resigned, he thought "Why not run?"

"I grew up with the sense that public service was important, and I wanted to help my community," Herod said. "When the [commission] opportunity came up, I thought I could help continue its 'new urbanism' vision." Though his opponent had the endorsement of previous officeholders, he won the election and soon joined the Athens-Clarke County Commission.

For Herod, holding public office is like having a second job, but one with hundreds of bosses. It also opened his eyes to the practicalities of "getting things done," as compared to planning. "The realities of government, even local government, are much more complex than one would think," he says.

As an example, Herod cites a recent ordinance that regulates water pricing for county customers. The county finally adopted a tiered system based on an average of prior winter usage rather than basing charges on the number of people in a home. This was thanks to an unrelated state law concerning rental regulation which makes it illegal for local governments to ask landlords how many people are living in their rental properties in single-family neighborhoods. In the end, he said, there's simply no way to verify how many people live in a residence, so a system of tier prices based on household size was deemed unworkable.

Friction between state leaders and local governments also frustrates him. The problem, Herod believes, is that "the different types of issues with which state leaders have to deal means it's hard for them to really understand what we do and what citizens expect from us in terms of local service provision. I think we need better understanding all around." In that regard, Herod says he would like to work toward developing better state-local government relations.

Still, he finds the experience rewarding. And his commission colleagues note that his service, in turn, is rewarding to them and to the community. "Andy's sense of humor—and his ability to explain his position to others—is what most of us admire and enjoy," says fellow Commissioner Doug Lowry. "We've had some great times, even when working on very difficult issues."

Commissioner Alice Kinman adds: "I can see many ways in which Andy's academic work informs his civic life. Most importantly, he is a big believer in civic life. He's always looking for ways to engage people in the political process."

– Rebecca McCarthy

PHOTO BY PAUL EFLAND/UGA



**Herod (above) represents the eighth district on the Athens/Clarke County Commission. (Below) Herod visits with Justin Babendreier and Martha Facemire, constituents in his district.**

PHOTO BY PETER FREY/UGA





## A global perspective

After graduating from the University of Bristol in 1986, Herod wanted to attend graduate school. Money for higher-education assistantships in Britain was virtually nonexistent during Margaret Thatcher's tenure, he said, but a British geographer with connections to Bristol brought Herod to West Virginia University under a grant from the U.S. National Science Foundation. There, while working toward a master's degree, Herod studied unemployment trends.

And there was plenty of unemployment to study. For instance, a glass-manufacturing plant in the area was closing, and the union decided not to fight the decision. "It was saying, 'Don't protest, don't do anything,' because the workers were worried about being seen as too militant," Herod recalled. "They wanted another company to come in, but the plant stayed closed." The pro-business gov-

ernor sued the company for closing the plant after it had accepted tax breaks from the state. The situation—of workers and a pro-business governor taking up positions contrary to those more expected—fascinated Herod. Writing about the dispute for his master's thesis, he concluded that their positions were, to a large degree, shaped by the different geographical networks in which they were embroiled. The workers couldn't afford to move elsewhere, while the governor was concerned about what the plant's closure would mean for the state's overall tax revenue.

After WVU Herod went on to Rutgers University, where his doctoral dissertation examined how the International Longshoremen's Association had been coming to terms, beginning in the 1950s, with freight containers and other technological innovations. The leaders sought to minimize job losses by adopting

a series of geographically informed strategies, Herod said. For example, instead of continuing to negotiate contracts on a port-by-port basis, as they had done for a century, they changed the geographical scale of their bargaining until by the 1980s they were working with a single national contract, one that made it more difficult for the shipping companies to pit dockers in different ports against each other.

Since then, Herod has become one of the most productive and innovative geographers in the country, and while he focuses as ever on local situations and front-line individuals his perspective is global. Thus among Herod's various grants is a project to facilitate a program for exchange of police and security officers from Tanzania with the UGA Police Department. He is an adjunct faculty member of the anthropology and international relations departments at UGA, and he teaches both

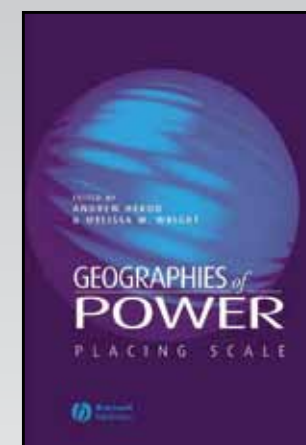
graduate and undergraduate courses. He is also director of the university's Paris Study Abroad Program.

"I would like people to think critically about how the world is connected geographically through the economic process," Herod says. "London and New York may be 3,500 miles apart, but after the 9/11 attacks the London stock market started to react in less than five minutes. Likewise, it's a small world when the explosion of an oil refinery in Nigeria can send economic shockwaves through the global economy."

**For more information contact: Andy Herod at [aherod@uga.edu](mailto:aherod@uga.edu)**

*(Rebecca McCarthy is a writer living in Athens. She wrote about addiction in the fall 2008 issue of [uga-research](http://uga-research.com)).*

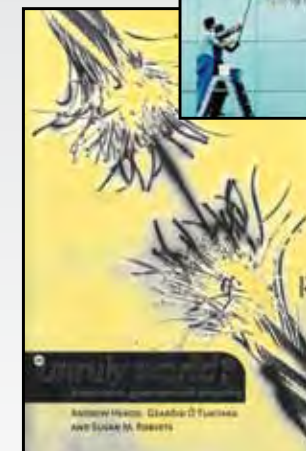
PHOTO BY SETH PERLMAN/AP



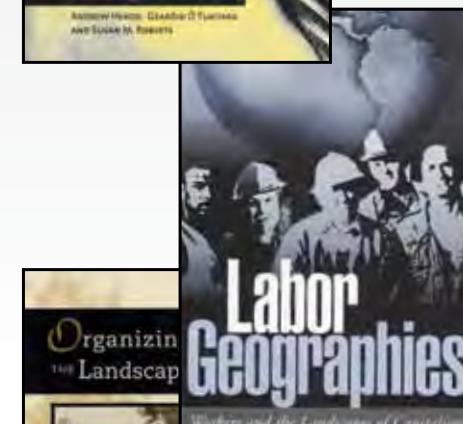
**Geographies of Power:** Explores the nexus of power and space behind the rescaling of contemporary social, economic and political life. It challenges many suppositions about concepts like globalization that so often are used by the powerful to peddle one world fits all solutions to economic questions.



**The Dirty Work of Neoliberalism:** In this collection of essays, an international group of scholars investigates the global building cleaning industry to reveal the extent of neoliberalism's impact on cleaners.



**An Unruly World?:** Explores the diverse conundrums thrown up by seemingly unruly globalization to show how free trade and deregulation are rewriting the rules of the global economy.



**Labor Geographies:** Examines the spatial contexts and scales in which workers around the world live, organize, and work to address particular economic and political problems.



**Organizing the Landscape:** An introduction to the culture and economic geography of labor unions that addresses the geographic dilemmas facing organized workers—like the Detroit auto parts workers—in a number of different situations, times, and places.



## interview



## The Orpinas File

**Hometown:** Santiago, Chile

**Education:** PhD, University of Texas, Houston, 1993  
MPH, UCLA, 1990

**Work history:** Assistant Professor, University of Texas, 1993-1996  
Assistant, Associate, and Full Professor, UGA, 1997-Present

**Research areas:** Prevention of violence in schools and in the family, adolescent health, program evaluation

**Research funding (major sources):** Centers for Disease Control and Prevention

**Courses taught:** Theories in Health Promotion, Injury Prevention, Women's Health

**Pamela Orpinas, professor of health promotion and behavior at UGA's College of Public Health, talks with [ugaresearch](#) editor Helen Fosgate about her research on bullying and violence in school settings and her belief that all students deserve a positive, inviting, and safe school environment in which they are free to learn.**

### **Q: What behaviors qualify as bullying?**

**A:** Bullying can range from simple name-calling to more serious behaviors such as threats, stealing and physical assault that, outside of school, are against the law. What differentiates bullying from other aggression is that it is repeated over time, and there is an imbalance of power. Bullies have some real or perceived advantage over their victims, such as having more friends or money, being bigger, or wearing the right clothes. Kids who bully often have poor social skills—difficulty with establishing relationships—and perform badly in school. But that is not true for all bullies; some have good social skills and use these skills to get information—which they then use against their victims—and influence others to follow them.

Victims have wide-ranging profiles, but for the most part they are perceived as being different in some way. They may not have the right friends or the right hair color. In general, the reasons why kids are bullied are irrelevant; they have done nothing to invite the abuse. However, there is another type of victim, the “aggressive victim,” who may irritate or annoy another student into aggressive behavior and then claim to have been victimized.

In addition to bullies and victims, a third group may influence the bullying situation: the bystanders. This group includes not only the students but also the adults who are present in the situation. Bystanders can be part of the problem or part of the solution. People can become part of the problem by laughing at the situation, by encouraging the bully, or simply by doing nothing to stop the bullying. Being part of the solution means to act to prevent the bullying from occurring (for example, inviting the victim to be a part of a group) or stop it when it does happen (for example, discouraging the bully or reporting the behavior).

### **Q: Have bullying and school violence gotten worse?**

**A:** We don't really know, as it's not a phenomenon that researchers have quantified over a long period. But we do know that meanness is often considered “cool” and accepted as part of the social norm. Research has consistently shown that boys rate higher than girls in physical aggression. Against popular belief, we have found that boys report as much or higher relational aggression than girls, that is, aggression meant to destroy social relationships, like passing rumors.

### **Q: What are some of the consequences of bullying?**

**A:** Most frequently, we see in the media the extreme consequences, such as homicide, when a victim finally retaliates against the real or perceived aggressors. Victims may also commit suicide, when they feel powerless to fight back. But there's also a wide range of effects outside these extremes, including fear, anxiety, depression, low self-esteem, and stress-related disorders. The victimized students may avoid eating lunch or going to the restroom because of concerns about being physically or verbally attacked. Their social lives may also suffer because other students don't want to be seen with them, as they fear becoming the next target. Victims may avoid going to school and may have difficulty concentrating in class and, as a consequence, their grades can decline. Bullying is also a problem for the bullies, who report that they feel worse about themselves than the non-aggressive students, which may help to explain the initiation of their bullying.

### **Q: What strategies are most effective at preventing or reducing school violence?**

**A:** Schools need to have a clear policy against bullying, not just physical bullying, but also verbal and relational bullying, which are harder to spot. The policy

should include clear consequences, and those consequences must be systematically enforced. The school community also needs to embrace social norms that discourage bullying, and create a positive environment that promotes trust, mutual caring, and respect. The limitation for schools, of course, is that they don't have any control over what happens at home or on the street, but they do have a lot of control over what happens at school. Adults often give the message, “You should solve this yourself,” but the victims wouldn't be victimized if they could solve it. How would we feel if our department head said, “solve it yourself” if we reported bullying in the office? If the bullying is dangerous, the child who is the target of bullying should report it immediately. In other situations, victims of bullying should keep a diary (when, where, who, what) so they can report specific incidents, rather than general complaints. They can take this information to a trusted teacher, school counselor, or principal and develop a plan to stop the bullying.

### **Q: How did you come to study bullying, and what drives your continued interest and commitment to research in this area?**

**A:** I'm from Chile, and I lived through the military coup, which happened on September 11, 1973. Chile was peaceful before that time, but for many years after the coup, violence became a normal part of life. And I got interested in how this happens and how violence affects people's behavior and cognitions. I studied psychology in Chile; then I received a Masters in Public Health at UCLA, and I earned my Ph.D. at the University of Texas. For my dissertation, I went to the local school district, and asked, “What do you need to know?” I developed a project on violence prevention based on their needs. I am currently also examining violence in dating relationships and early predictors of high school dropout.

**For more information contact:**  
**Pamela Orpinas at [porpinas@uga.edu](mailto:porpinas@uga.edu)**





PHOTO BY ROBERT NEWCOMB/UGA

# CHRONICLER OF DIVERSITY

Hugh Ruppersburg shows that the literature of the South—and of Georgia in particular—is a tapestry of many voices and backgrounds.

BY PHILIP LEE WILLIAMS

Southern literature has long staggered under the weight of the past. Yet as Hugh Ruppersburg has been steadily demonstrating in recent years, the richness of the South's history has created a new context that writers have taken in a thousand different directions.

Among the most eminent scholars of fiction, poetry, and short stories from the South, Ruppersburg has been a notable presence on the UGA campus for more than 30 years. Throughout his service as faculty member in the English department, head of the department, and dean—he is now senior associate dean of the Franklin College of Arts and Sciences—Ruppersburg's productivity as a scholar has never flagged.

No single person has made a greater contribution to

focusing critical attention on Georgia literature. His contributions were recognized in 2008 with the Georgia Governor's Award in the Humanities, and earlier this year he received the University of Georgia Research Foundation's Albert Christ-Janer Award, which honors an outstanding body of nationally and internationally recognized scholarly work in the creative arts and humanities.

Ruppersburg is the editor of four influential anthologies of Georgia writing, as well as *The New Georgia Encyclopedia Companion to Georgia Literature*—a goldmine of insights and biographical information on dozens of Georgia writers. In that major work and in others, he has shown for the first time the richness of the state's literature, especially that produced by living writers.





## GEORGIA'S "INTENSE VARIETY"

Ruppersburg may have grown up on standard southern fare such as *Gone with the Wind*, which he read when he was 10, but by the time he came to UGA as a freshman in 1968 his worldview was widening. He began to see that Southern literature was made up of many voices and reflected writers from diverse backgrounds.

After earning his bachelor's degree *summa cum laude* in English at UGA, Ruppersburg earned master's and doctoral degrees at the University of South

Carolina, where he was in a strong English department that included writers James Dickey and William Price Fox. He returned to UGA as an English instructor but soon became an assistant professor and was

well on his way to academic achievement.

"In the late 1980s I began to think about collecting examples of Georgia's writing into a single volume," he says. "There were some fine literary anthologies for other states, but no one had done it here. This would be a worthwhile effort, I thought, because Georgia had produced an impressive array of writers and I saw it as an opportunity to celebrate the state's literary heritage. When I proposed the idea to Karen Orchard, then-editor of the University of Georgia Press, she was enthusiastic. In fact, she suggested not one but three volumes, each devoted to a different genre of literature: fiction, nonfiction, and poetry."

That was the origin of the *Georgia Voices* anthology series, which began in 1992 with fiction, continued in 1994 with non-fiction, and concluded in 2000 with poetry. Still, the sequence had one striking omission—the short story. And because Georgia was home to Flannery O'Connor, one of the 20th century's modern masters

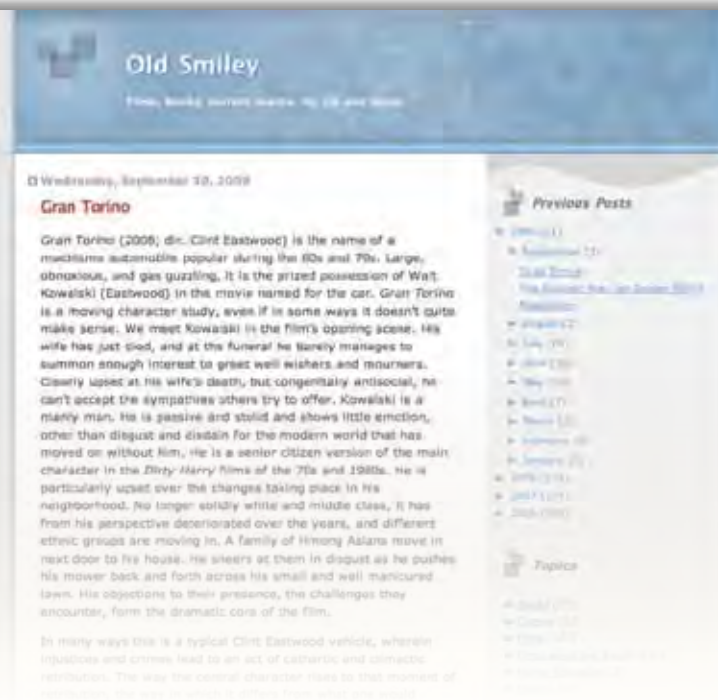
of the form, Ruppersburg added a fourth volume, *After O'Connor: Stories from Contemporary Georgia*, which was also published by UGA Press.

"From the start, I wanted to show the intense variety of the state's writers," he says, "male and female, black and white—writers who reflect the diversity of life here."

These anthologies—and they were not Ruppersburg's first books, his having written scholarly volumes on Faulkner and Robert Penn Warren—revealed just how much the state's literary output was unlike stereotypes of Southern writing. "A pervasive notion has been that literature from the South reflects it as a place apart, that the South has its own distinct values and culture," he says. "But over the past 40 years, this notion has been overturned. One of the basic purposes of these books, then, was to demonstrate the lack of singularity in the South's culture—its distinctiveness but also its continuity with the rest of the nation and the world."

## RUPPERSBURG BLOGS ON BOOKS, FILM, LIFE

While his research has primarily focused on southern literature, Ruppersburg also is interested in films about the South. He has for several years been working on a book and teaching classes in films about the South, some by southerners but most not. While most people are familiar with such staples as *Gone with the Wind* and *O Brother, Where Art Thou*, fewer know contemporary gems such as *Junebug*, a 2005 film or *Sherman's March*, an offbeat documentary from the 1980s. One section of his blog is devoted solely to films about the South. In it, Ruppersburg looks at box office hits such as *Forrest Gump*, *Fried Green Tomatoes*, *Norma Rae*, and *Cool Hand Luke* as well as the older, and no longer available film, *Song of the South*. He points out that while "the film's reputation as a racist encomium to the Old South has prevented its release in DVD, it is an important document in the response of American films to history, slavery, and to race relations in the 20th century." Find his extensive blog on films and books at: [oldsmiley.blogspot.com](http://oldsmiley.blogspot.com).



## NOT YOUR GRANDPARENTS' SOUTH

In a paper that Ruppersburg delivered at Georgia Southwestern University in Americus in 2005, he explained how the new diversity of population in Georgia and the South is propelling dramatic changes in current literature.

"Clearly one of the most significant changes in the state has been the growth in the Latin and Hispanic populations," he noted. "In the 1990s alone the state's Latin and Hispanic population grew 300 percent. In the 2000 census, 435,227 people listed themselves as of Latin or Hispanic origin. And when we count the undocumented along with the documented population, the number approaches more like 800,000, or close to 10 percent of the state's population. This means non-whites make up about 40 percent of the state's total population."

Moreover, some 40 percent of the people living in Georgia to-

day were born elsewhere. Yet, as Ruppersburg sees it, that only adds new ideas and images to the tapestry of "Georgia voices." So, while his South may not be the South of your grandparents, in many ways it's fuller and deeper—a reality that will fuel his research on the subject for years to come.

Currently, Ruppersburg is working on a series of scholarly articles, including one on noted Southern writer James Kilgo, another on the last poems of Robert Penn Warren, and a third on the Elvis Presley film *Blue Hawaii*.

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(Philip Lee Williams is assistant dean for public information in the Franklin College of Arts and Sciences).





## viewpoint

*Accommodating the ways in which knowledge is presented and evaluated can help level the playing fields for learning-disabled children, adolescents, and adults*

**By Noel Gregg**

*Distinguished Research Professor and Associate Dean for Research College of Education*

PHOTO BY DOT PAUL/UGA

# Provide Equal Access to Learning

**L**earning disabilities (LD) and attention deficit/hyperactivity disorder (AD/HD) affect critical learning processes, including reading, writing, and mathematical skills. And while the manifestations of LD and AD/HD may change as individuals develop and respond to new demands—for example, when leaving school to enter the workforce—they do not go away. Adolescents and adults with LD or AD/HD may learn to compensate, but they never outgrow their problems with literacy; these neurological conditions persist throughout life.

Although most of the research on learning disabilities has focused on children, research related to adolescents and adults is increasingly being funded. For example, I was recently chosen to participate on an expert committee cosponsored by the National Academy of Sciences and the National Institute for Literacy. Charged to study the scientific foundations of adolescent and adult literacy and their implications for policy and practice, the committee will integrate the research on literacy from education, cognitive and behavioral science, neuroscience, and other relevant disciplines. We will then use these findings to provide a strong empirical foundation for understanding the main factors that affect literacy learning in adolescent and adulthood.

Among other related efforts, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, along with the National Institute for Literacy, recently created an expert working group of which I am also a member. Its purpose is to identify the state of science on the development of writing ability across the human lifespan.

If the literacy issues facing an adolescent or adult with LD or AD/HD are not adequately addressed, they can limit the individual's prospects for education, employment, and personal relationships. People with LD or AD/HD drop out of high school two to three times more than their peers, and they enroll in college or pursue other postsecondary training at one-tenth the rate of the general population. Much can be done, however, to improve these statistics. "Accommodations," which adjust the manner in which learning is presented or evaluated so that individuals with LD or AD/HD can access and demonstrate knowledge in a fair and equitable fashion, help to level the playing field. For those who receive effective testing and instructional accommodations, such as more time to accomplish a task, the odds increase significantly that they will complete secondary and postsecondary education.

There are no silver bullets, however, as appropriate accommodations vary with the individual. A given student might have significant deficits that limit his or her ability to fluently read or spell words, yet he or she may demonstrate above-average lan-

guage and reasoning abilities. For such a student, it is critical that access to learning be provided through tools other than those that require reading printed text. Alternative media (e.g., electronic text) and text-to-speech software may help provide him or her equal access to information.

Beyond individuals' variations, social contexts change over time. Research initiatives—and the range of potential accommodations—must be accordingly adjusted as well.

Not surprisingly, accommodations made in testing, instructional, and employment situations for adolescents and adults with LD or AD/HD have led to a great deal of debate—and from several perspectives, including method, policy, and legal. But one of the most significant barriers facing individuals qualified to receive accommodations is the lack of pertinent public knowledge. Without an understanding of the issues that influence the availability and selection of accommodations, the potential exists to underuse them, overuse them, or simply use them incorrectly. The modification of standard approaches to accessing and demonstrating knowledge requires thoughtful deliberation and practice—and not only with reading and writing—but also with regard to merit, equality, and fairness.

The need for evidence-based research on the literacy issues facing adolescents and adults with LD and AD/HD cannot be overstated. In light of the profound changes taking place in a digital, networked, multimodal, and multitasking world, the necessity for adolescents and adults with LD and AD/HD to have accommodations has never been more critical.

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## behind the scenes

### Origami brings math majors into the fold

Origami, the Japanese art of folding paper, often takes its inspiration from birds, flowers, and other shapes in nature. But Robert Rumely, UGA professor of mathematics, also uses the ancient art as a teaching tool in his seven-week summer math class, part of the Research Experience for Undergraduates program funded by the National Science Foundation.

"I realized several years ago that origami could illustrate some genuine mathematical concepts," said Rumely. "And it's interesting—not only from a mathematical standpoint but also from an artistic one. While we use it as a teaching tool in class, it's also an intensive activity that's very enjoyable."

Rumely, a numbers-theory researcher, said that while origami has been around for centuries, it has only recently become a vehicle for mathematicians and engineers who study geometric principles. "Lots of specific questions can be answered by looking at a series of designs," he said. "For example, one question we tackle in this class is 'What is the origami box of largest volume for a given sheet of paper.'"

The students, who apply to the program in the spring, hail from colleges and universities across the country. The seven in this year's class included math majors from as far away as Regis University in Denver, the University of Michigan, and the University of Nebraska. Only one in five who applies is admitted.

Patrick Dukes, a senior at Winthrop University in South Carolina, plans to attend graduate school. "I wasn't sure before, but attending this class gave me a real feel for research, and that helped me decide to pursue an advanced degree," he said.

**For more information, contact Robert Rumely at: [rr@math.uga.edu](mailto:rr@math.uga.edu)**

—Helen Fosgate

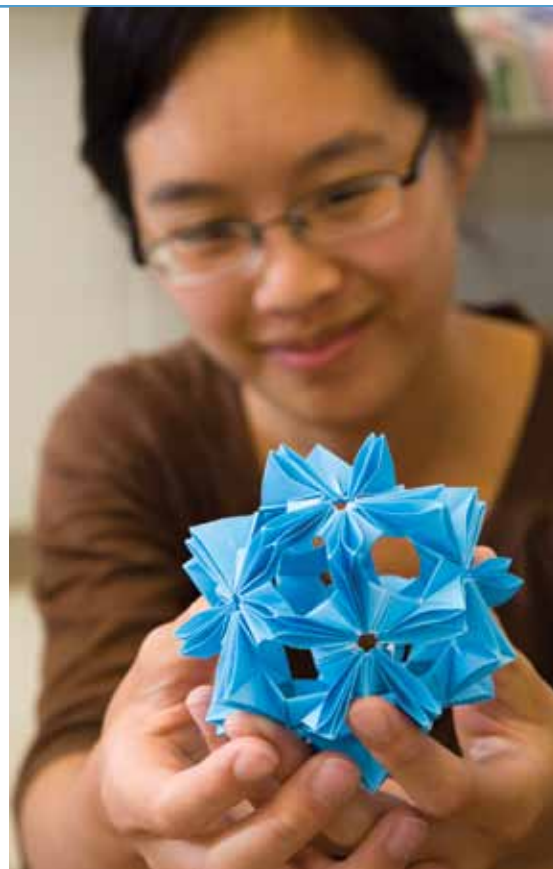


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**Anne Ho (above), a senior at Regis University in Colorado, displays one of the origami sculptures she made in class.**