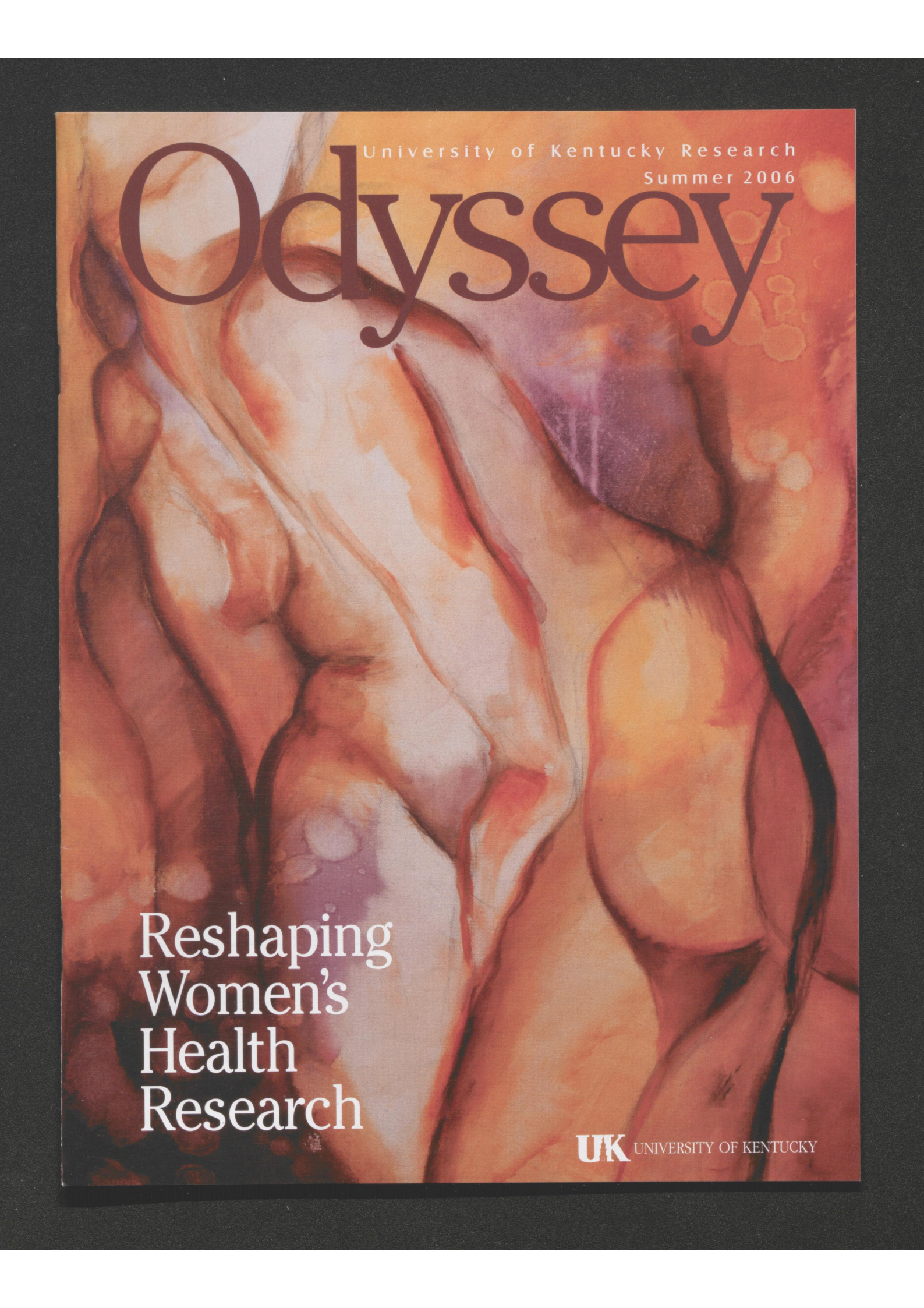


An abstract painting of a woman's torso, rendered in warm, earthy tones of orange, red, and brown. The brushstrokes are visible, creating a textured, expressive effect. The figure is positioned centrally, with the head and arms partially visible at the top and sides.

Odyssey

University of Kentucky Research
Summer 2006

Reshaping
Women's
Health
Research

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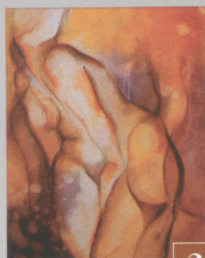


Cover Story

Reshaping Women's Health Research

UK is shaping the future of women's health by starting at home. The Center for the Advancement of Women's Health is leading a statewide push, through the Kentucky Women's Health Registry unveiled last March, to collect information to track health trends and recruit women to participate in medical trials. The Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program and the Center of Biomedical Research Excellence (COBRE) in Women's Health are training and supporting the next generation of scientists. And the Center for Research on Violence Against Women is working to improve women's safety and access to help after victimization.

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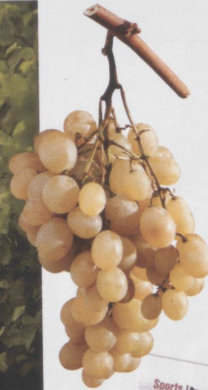


For more on artist Victoria Flanigan, see the back cover.

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Enlisting Blackberries in the Fight against Cancer

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UK's Russell Mumper is working with a local blackberry producer to find out if blackberry extract can be used to fight cancer. It's a Kentucky-grown partnership that may lead to new discoveries about the disease-fighting properties of the blackberry.

Kentucky's Grape and Wine Industry
Bursting with Potential

Telling the Stories That Need to Be Told

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Shedding brighter journalistic light on the issues facing rural America is the goal of UK's Institute for Rural Journalism and Community Issues. Backed by 26 years' experience at the Louisville *Courier-Journal*, Director Al Cross is working with reporters throughout the country to get important stories onto the front doorstep of rural communities.

In Brief

Raloxifene can prevent breast cancer • French magazine features UK digital unwrapping • faster flow with nanotubes • *C. diff* vaccine • macular degeneration discoveries • new pharmaceutical facility opens at Coldstream

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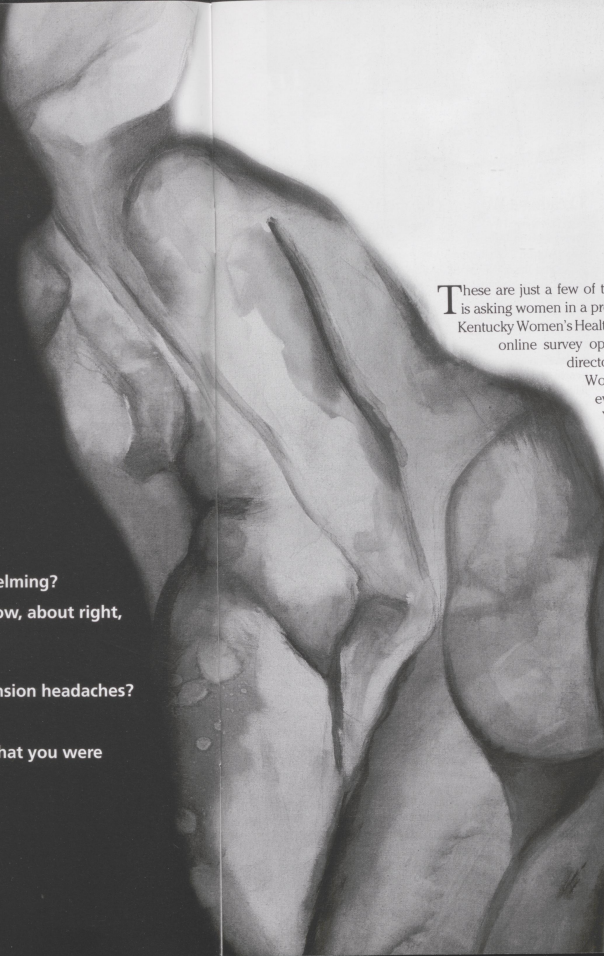


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Is this your last

Odyssey?

It doesn't have to be. See postcard.



Reshaping Women's Health Research

How would you rate the amount of stress you are currently under: small, moderate, large, overwhelming?

How would you describe your current weight: too low, about right, a little overweight, fat, obese?

Do you have any form of diabetes?

Have you ever had migraines, cluster headaches, tension headaches?

Have you had excessive anxiety or worry?

Have you ever felt, or has anyone ever suggested, that you were a problem drinker?

Has an intimate partner hit, kicked, punched, or otherwise hurt you?

Written by Alicia P. Gregory
Artwork by Victoria Flanagan

These are just a few of the questions the University of Kentucky is asking women in a program unveiled in March 2006 called the Kentucky Women's Health Registry. The registry is a comprehensive online survey open to all women. And Leslie Crofford, director of UK's Center for the Advancement of Women's Health, emphasizes, "You don't even have to be seen by a doctor at UK. You just report to us the information you want to give, and it will help us learn how to better care for Kentucky women and give interested women the chance to participate in medical research."

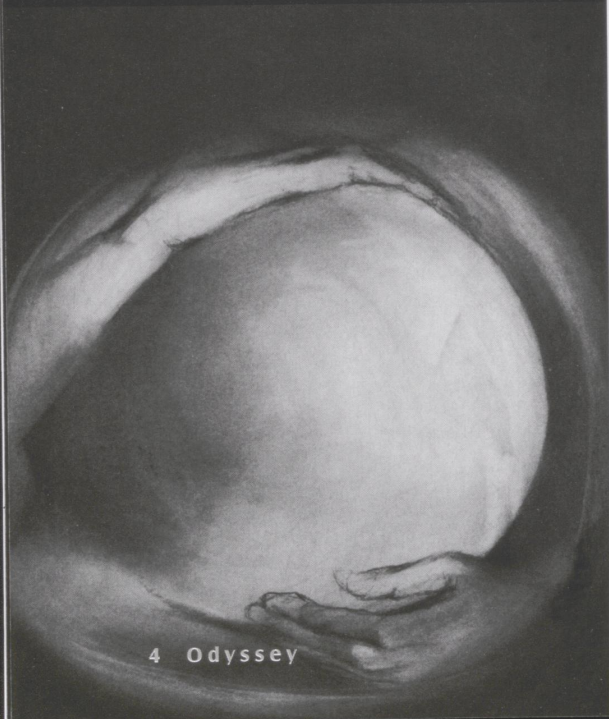
The Kentucky Women's Health Registry is just one UK initiative targeting women's physical and mental wellness. The Center for the Advancement of Women's Health is combining research, clinical care, training, and outreach to offer women one-stop shopping when it comes to their healthcare. Other important, multidisciplinary efforts, like the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program and the Center of Biomedical Research Excellence (COBRE) in Women's Health, train and support research faculty. And UK's innovative Center for Research on Violence Against Women is working to improve women's safety and access to help after victimization.

UK scientists and scholars who are advancing women's health research through these and other ongoing projects focused on women currently have attracted \$112.5 million in funding.

"Why do some diseases affect women more than men? Why do women respond to some drugs and therapies differently than men? What environmental factors and behaviors most influence women's health?"

"We don't know. But we want to find out. And we need the help of women of all ages and races across Kentucky."

—Leslie Crofford



Creating a Women's Health Registry

Why do we need the Kentucky Women's Health Registry? Crofford answers this question with a few of her own: "Why do some diseases affect women more than men? Why do women respond to some drugs and therapies differently than men? What environmental factors and behaviors most influence women's health?"

"We don't know. But we want to find out. And we need the help of women of all ages and races across Kentucky," Crofford says. Her enthusiasm about the registry and eagerness to spread the word is evidenced by recent road trips to county agricultural extension and health department offices. "I wanted to meet face-to-face with the people who work on a daily basis with the women in their communities," Crofford says, adding that she's asking these county workers to put up posters and refer women to the Internet survey or hand out paper surveys.

Statewide radio spots, billboards and targeted recruitment efforts in Eastern and Western Kentucky, as well as in the African-American and Hispanic communities, are some of the ways Crofford hopes to enroll 2,500 women in the registry in its first year. Over the next 10 years, she hopes to collect data from 25,000 Kentucky women.

With questions ranging from demographics, financial issues, health-care access, chronic symptoms, medical diagnoses, and domestic violence, the Kentucky Women's Health Registry survey is uniquely comprehensive. "Other states, like Michigan, where I worked last, have surveys, but we designed ours to be much broader," says Crofford, who came to UK in October 2004.

"The breadth of information will allow us to see how individual health behaviors affect overall health. Many women haven't been educated or haven't internalized the things we know about what promotes good health—maintaining a healthy weight, getting the recommended amount of exercise, managing stress, not engaging in risky sexual behavior, not smoking or drinking to excess. When you look closely, women don't have just one of these issues," she says. "For example, they smoke and have a sedentary lifestyle, or drink and engage in risky sexual behaviors.

"The information we get from this survey will help us understand how these behaviors relate to one another, allow us to identify things that promote unhealthy lifestyle choices and create targeted programs to help women change these behaviors."

The enormity of this challenge is not lost on Crofford. "It's not an easy thing to do, but my own belief is that if you change women's behaviors, you can change family behaviors." She grins and says, "We do most of the shopping and cooking, right?"

"We need to understand the barriers to change, and then be able to provide the encouragement and training to allow women to take charge of their health."



And part of that take-charge attitude, Crofford adds, beyond an interest in their own health and the health of their families, is a desire to contribute to the health of women everywhere by taking part in medical research. Wendy Baldwin, UK executive vice president for research, says, "Over the past few years there has been an increased effort to include women in clinical trials and to analyze the data to test for gender differences. We are finding many situations where men and women present with different symptoms, have different courses of illness or react differently to medications."

A Food and Drug Administration report, "Equality in Clinical Trials: Drugs and Gender," says, until recently, women were not routinely included in safety and efficacy tests of new drugs for their own protection, "since there was often no way to be sure that a woman was not pregnant or that the drug might not cause some problem that might interfere with future pregnancies. In addition, it was thought that women's hormonal cycling or other factors peculiar to being female might constitute variables that could skew trial results."

Researchers used to assume that disparity in height, weight and hormones explained why men and women react differently to the same drug, but two studies in 1996 painted a more complicated picture.

In the first study, women woke up almost twice as fast (7 minutes versus 13 minutes) from anesthesia as men, and weight had nothing to do with it. The other study showed that a painkiller worked twice as well for women than men who had their wisdom teeth removed, even when body size and menstrual cycle were factored in.

Baldwin notes, "A national push to include more women in clinical trials will help answer these questions and truly make medicine better targeted for all people."

Crofford says, "We created the Kentucky Women's Health Registry to streamline the process of linking up women who want to participate in medical trials with researchers who need their help."

Scientists will face a review process (led by the Center for the Advancement of Women's Health) to gain access to women in the registry. "It's not like any Tom, Dick or Harry can come in and say, 'I'd like to get patients out of your registry to do X.' That's not good enough. The research study has to be focused, spell out why

Leslie Crofford, director of the Center for the Advancement of Women's Health, led the creation and marketing (including this billboard in downtown Lexington) of the Kentucky Women's Health Registry. This online survey will collect health information from female volunteers over the next 10 years to track health trends and serve as a recruitment tool for clinical trial participants.

women are going to be studied, and the researchers have to agree to do gender-specific data analysis so that the effect of X on women is clear.

"Because we want to be able to track changes in health over time," Crofford says, "we'll send annual reminders to women to retake the survey." Registry participants will also receive health information updates and access to clinical trials of new therapies for conditions that affect them. "You agree to be contacted as part of filling out the survey, but participation in clinical trials is your choice," she says.

Advancing Women's Health

The Center for the Advancement of Women's Health began in 1999 (under the moniker of the Women's Health Center) and the first director, Deborah Kwolek, made a lasting impact on UK. She received a grant to incorporate gender-specific issues into the curricula of the colleges of allied health, dentistry, medicine, nursing, and pharmacy. The curricular elements she helped create are now standard training for UK health students. For example, gender differences in drug metabolism (there are significant differences between men and women in the way drugs are absorbed, distributed and concentrated in the bloodstream) were incorporated into pharmacy courses. And students train with patient scenario role-playing (with actors portraying patients with, for instance, head and neck trauma associated with domestic abuse).

In 2000, a group of female community leaders rallied behind the

Statewide radio spots, billboards and targeted recruitment efforts in Eastern and Western Kentucky, as well as in the African-American and Hispanic communities, are some of the ways Crofford hopes to enroll 2,500 women in the registry in its first year.

Women's Health Center. Led by Mira Ball (a UK trustee, chief financial officer of Ball Homes Inc., and former Fayette County public school teacher), these women raised the funds to endow a chair for the center director, named for former first lady of UK Gloria Singletary. "They had the enthusiastic participation of Gloria herself," Crofford notes, adding, "She's a champion of women's health issues and an unbelievable lady." Private donations were matched by funds from the state's Research Challenge Trust Fund to create the chair.

Crofford's own journey to UK began with a phone call from a former intern from Crofford's residency days at Barnes Hospital in St. Louis. That call was from Anne Pittman, a UK associate professor in internal medicine, who had just been named to the search committee for the center director. "She knew my background," Crofford says. (Crofford trained in molecular biology and held a rheumatology fellowship at

the NIH, and was, at that time, a professor of rheumatology at the University of Michigan.)

Crofford studies fibromyalgia—chronic, widespread muscle pain, accompanied by fatigue. In 2005 the journal *Arthritis & Rheumatism* published her study on Pfizer's drug Lyrica™, which was shown to significantly reduce the pain of fibromyalgia and improve sleep. "The inflammatory stress-related diseases I study are much more common in women, so when Anne was casting about for people she knew with a connection to women's health, she found me."

And what started as a search for one, became a dual recruitment. "I wasn't so sure at first. My husband is also in academic medicine, and we were happy where we were. But Anne begged me to send her both of our CVs, which I did," Crofford recalls. "And then the next thing we knew, Al Cohen, director of the UK Markey Cancer Center, was on the phone to my husband." Kevin McDonagh, Crofford's husband, became chief of hematology/oncology and deputy director of the Markey Cancer Center, and she became chief of rheumatology and director of the Center for the Advancement of Women's Health in 2004.

Her first order of business, Crofford says, was helping the center "find its research legs" by recruiting an associate director for research. That role was filled by Sara Jo Nixon, a UK psychology professor who now spearheads the first of two research groups. Nixon's group will design research projects to explore the interaction of different health behaviors (i.e., smoking, drinking, sedentary lifestyle) by examining

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for details.

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for details.

the Kentucky Women's Health Registry. Nixon has already been involved in such behavioral research—a National Institute on Drug Abuse project that began with the unlikely (and somewhat unpopular) premise that nicotine may have some positive effects for substance abusers. (For more, see *Odyssey* Summer 2004 at www.research.uky.edu/odyssey.)

The second research group focuses on stress-related syndromes. "One of the things that became very clear once I got here was that UK has a huge amount of expertise in neuroendocrine immunology," says Crofford, who will partner with Suzanne Segerstrom (psychology/optimism and immunity), Mary Duke (internal medicine/chronic fatigue), Deborah Erickson (urology/irritable bladder), Lisbeth Selby (gastroenterology/irritable bowel), Tarvez Tucker (neurology/UK Headache & Pain Clinic), Charles Carlson (psychology/orofacial pain), and Reny de Leeuw (dentistry/orofacial pain).

The Center for the Advancement of Women's Health targets UK students, as well. "We train students and residents in nursing, medicine and pharmacy in gender-specific issues related to their field. We have an internal medicine residency track in women's health that allows us to target primary-care providers."

The center also supports community outreach efforts, like Crofford's own two-hour workshops on fibromyalgia. She sees the center's outreach role expanding as other practitioners adopt similar formats for conditions like chronic fatigue and irritable bowel syndrome. "Although we know we can't see every person individually in our clinic, the center can be a resource for women in the community who may or may not be patients at UK."

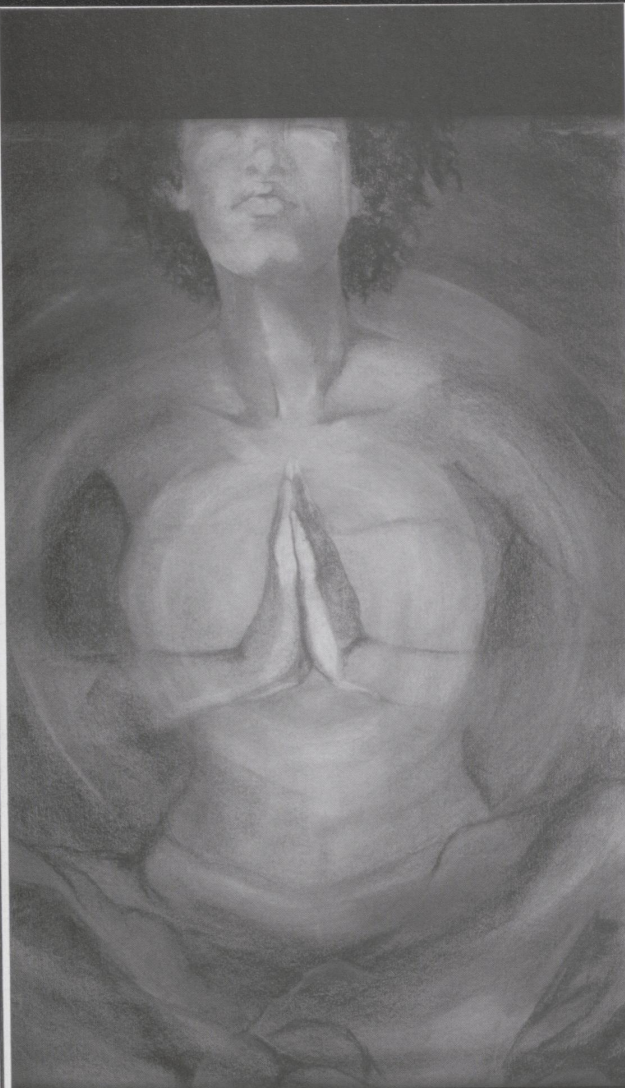
The bottom line for her center, Crofford says, is helping women take charge of their own health before a devastating diagnosis. "By the time a woman gets to the Gill Heart Institute, she's already had a heart attack. By the time she gets to the Markey Cancer Center, she's already got cervical cancer. That's too late. We know cervical cancer is associated with sexually transmitted disease. We know endometrial cancer has a strong link to obesity. Our job is to understand these modifiable risk factors and teach prevention."

And that prevention takes the form of the Women's Health Clinic. Shortly after her arrival on campus, Crofford secured dedicated space for this new multidisciplinary clinic on the second floor of the Kentucky Clinic. "We've always had good primary care, which is a strong partnership between College of Medicine M.D.s and College of Nursing ARNPs," she says, but these primary-care providers used to see patients in an over-crowded internal medicine clinic. Now, women have a space all their own.



Women's Health Statistics

- Heart disease is the number one killer of women in the United States.
- Colorectal cancer and breast cancer are the second- and third-leading cancer killers of women.
- Women are more likely than men to die from a stroke.
- Nearly twice as many women as men die from Alzheimer's disease each year.
- 75 percent of Americans living with autoimmune disorders, including lupus, multiple sclerosis and rheumatoid arthritis, are women.



"This is an exhausting and emotionally draining field to be in because you're exposed to some of the most horrific cruelties that one person can perpetrate on another. But you also see the amazing resiliency of women and children. Violence clearly changes a woman's life, but it need not ruin it. And as researchers and educators, we can play a role in ensuring it doesn't."

—Carol Jordan

"In fact, this is for the clinic," she says, pointing to a painting that, for the time being, hangs in her office. Muted gold and blue rectangles highlight the outline of a woman. Her head is back and her hand covers her breast. An X-ray view of her spine and pelvis shows the underlying strength of her form. "I commissioned this from a UK graduate student. She was exploring issues of body and acceptance. I think it's important that we be conscious of the relationship between women and their bodies." The artist, Victoria Flanigan, who created the cover of this magazine and artwork for this article, earned her master's degree in fine arts at UK in May 2006.

Crofford's goal for the clinic: create a one-stop shop for healthcare. "We don't want women to have to make extra trips. We've added sub-specialists in rheumatology, gastroenterology, neurology, gynecology, and nutrition. We'll soon have a nurse psychologist to see patients in our clinic and a staff member trained in the Cooper-Clayton smoking cessation program. By adding these sub-specialties and quality-of-life programs, we can better assist our patients in learning how to live healthy lives."

Crofford adds, "We're not duplicating UK programs that are great—like the Comprehensive Breast Care Center. It's wonderful that the Markey Cancer Center and Gill Heart Institute are right here on campus. Our hope is that we fit nicely within the spectrum of clinical activities at UK."

"If we can intervene early, when women first develop symptoms of pain and stress, we can stop these things from mushrooming into huge, lasting problems 10 years down the road."

Breaking the Cycle of Violence against Women

After leaving work at a salon in a Louisville, Kentucky, shopping mall, Mary Byron sat in her car as it warmed up. It was December 6, 1993, just weeks after her former boyfriend had been arrested and jailed for kidnapping and raping her. Mary thought she was safe. But she didn't know her attacker had posted bail.

Mary's former boyfriend approached her car and fired seven bullets into her head and chest. It was Mary's 21st birthday.

"She had asked a number of different people in the local justice system to let her know if her attacker was released," explains Carol Jordan, director of UK's Center for Research on Violence Against Women, "but whatever the good intentions were of these professionals, that notice never came and her life ended that day."

Mary's horrific case led to the creation of VINE® (Victim Information and Notification Everyday), a 24-hour, automated phone and email system that updates victims on the custody status of offenders. VINE was first implemented in Jefferson County, Mary's home county, one year after her death. Jordan, who has spent 23 years helping women and children who have faced sexual assault, intimate partner violence, child abuse, and stalking, co-authored legislation in 1996 to expand the system, making Kentucky the first state in the nation to offer a statewide victim notification system. Today more than 1,400 communities in 36 states offer VINE.

"VINE has literally saved lives," Jordan says. "And Mary's story also led to the creation of the Mary Byron Foundation, which funds innovative programs across the country that seek to break the cycle of violence against women. The foundation contributed \$10,000 to the UK Center for Research on Violence Against Women when we started in 2002, and just last April gave us \$50,000 to establish the Mary Byron Scholars Program, a graduate fellowship in her name."

Before coming to UK, Jordan spent eight years on the executive staff of former Governor Paul Patton, spearheading the state's effort to address violence against women and children. Over her career she successfully lobbied for 30 pieces of legislation, including bills to improve mental health services, strengthen prosecution, expand civil remedies for victims, and to create innovative systems like VINE and Kentucky's Amber Alert System. She secured the first state funding for rape

crisis centers and for children's advocacy centers. With the Kentucky Domestic Violence Association, she increased state funds for domestic violence programs to \$4.8 million, an increase of 112 percent. In 1996 she authored a resolution to encourage colleges and universities across Kentucky to increase curricula related to violence against women and children.

"I'm so pleased to now be here at UK and have a role in making that resolution happen," says Jordan, her energy and passion for what she does evident with each word. Leslie Crofford, COBRE director Tom Curry and BIRCIWH director Jef Ferguson all use the same word to describe Jordan: dynamic.

Why was such a center necessary? "During my time in the governor's office, I realized police, advocates, thera-

pists, physicians, and nurses were just not adequately prepared by their graduate coursework to identify violence in the lives of their patients or clients, or to know what course of action to take if abuse was disclosed. Our educational system was inadequate. And, as a nation, we lacked a research agenda on violence against women, which meant we weren't doing enough research, and we were doing an inadequate job of putting good research in the hands of the professionals who need it.

"It is both a strength and a challenge that there is no discipline called 'violence against women.' It crosses traditional academic boundaries—psychology, law, social work, medicine, nursing, women's studies, and

continued on p. 11

Director Carol Jordan (center) and the staff of the Center for Research on Violence Against Women are involved in research projects focused on protective orders and sentencing decisions in domestic violence cases. From left to right: Emily Bradshaw and Emily Hodell (psychology doctoral candidates), Lana Stephens and Laurie Depuy (office staff), Danielle Duckett-Pritchard (second-year master's student in sociology), and Adam Pritchard (sociology doctoral candidate).



2004 UK Women's Safety Study

In September 2004, the Center for Research on Violence Against Women released results from a study that polled 1,010 female graduate and undergraduate students at UK. The study revealed that 36.5 percent of these women had been sexually or physically assaulted, or stalked. Center Director Carol Jordan says UK's number mirrors that of other universities, but fewer UK women report crimes than women do at other institutions.

She explains that a national study of college women in 2000 showed 5 percent report their sexual victimization to law enforcement. "Our study found about 1.5 percent of UK college women report sexual assault," Jordan says. "What that tells me is we're not doing a good enough job of communicating to women that at UK there are people prepared to help them if they reach out, and that they won't be blamed for their victimization."

"We also asked how safe women feel at UK, and only 15 percent said they feel afraid. While that seems like good news—that the vast majority of women here feel safe—in comparison to the percentage of women who actually experience victimization, female students at UK may be inaccurately appraising their level of risk. We need to do a better job of educating them about the realities of violence." The study also asked women who they fear—strangers or known partners. "Most chose strangers. But the study showed that 82 percent of UK women who had been victimized were harmed by someone they knew, not a stranger."

Based on U.S. Department of Justice data, UK ranks last in the Southeast in per capita spending for police. "UK also ranks last among benchmark and Southeast Confer-

ence universities in the student-to-officer ratio," Jordan says.

To address the prevalence of victimization, the lack of adequate support services for victims, and the need for education among all students, in 2005 UK President Lee T. Todd Jr. committed an additional \$1.25 million in funding to support new programs. These programs include UK Women's Place (a central point of contact for coordinating referrals for counseling and academic,

Eighty-two percent of UK women who had been victimized were harmed by someone they knew, not a stranger.

financial and medical help), new landscaping and lighting, first-responder training, and funding for an additional police officer. "This was four times more than UK spent on women's safety programs in 2004," says Jordan. "Dr. Todd deserves a lot of credit for being willing to release this data and draw attention to the problem. Literally hundreds of people all over campus are now involved in increasing women's safety."

Jordan says her center will seek funds in 2007 to do a follow-up study. "We hope our efforts to improve safety at UK will mean a lower prevalence and an increase in women who report their victimization. It's very troubling that the vast majority of women who suffer some form of harm never tell their friends, roommates or family, let alone the police. We need to let women know that this is an academic environment where you can get support if something like this happens to you."

more. That's why an interdisciplinary approach is so important."

The Center for Research on Violence Against Women was the brainchild of Jordan and former UK Provost Mike Nietzel. "We wrote a concept paper, and I took that to the governor and Mike took it to President Todd, so the center was really a partnership between the university and the governor's office. Next, we created an advisory committee of faculty from all the disciplines I just mentioned to get input on what the center's direction and focus should be." After leaving the governor's office, Jordan was recruited by UK to serve as the center's first director.

The center's national advisory committee is made up of faculty from prestigious universities across the country, Kentucky advocates and practitioners, and UK faculty associates from the colleges of arts and sciences (psychology), law, medicine (OB/GYN, psychiatry, behavioral science), nursing, social work, the women's studies program, and the Center for the Advancement of Women's Health.

"We have the potential to be a nationally preeminent center—something that is not duplicated anywhere in the country," says Jordan, who in 2005 received the Paul H. Chapman Award from the Foundation for Improvement of Justice. The award recognizes innovative programs that can serve as national models. She says, "The fact that we have made reforms on behalf of women and children in Kentucky and that those reforms have been shared with the nation speaks not to what a single person has done, but to what the collective effort of people believing deeply in their work can create."

Jordan donated the \$10,000 check she received for this award to the center to support the creation of an endowed chair in mental health, a field she is particularly passionate about. Jordan spent three years as a clinical psychologist before becoming a policymaker.

"I believe we have the opportunity to create an unparalleled center on the empirical study of violence against women, because of the quality of the faculty already here, the prestigious faculty we plan to recruit, and because of the way our work has been embraced by the professional and academic community. We're ready to do this on a grand scale by endowing five chairs of study on violence against women." This immense fundraising effort—a minimum of \$1 million per chair—will help UK become "the place where the top scientists publishing and researching in this area are located and where graduate students and faculty will want to be."

Funding is already set for the first of the five chairs: the Verizon Wireless Chair of Studies on Violence Against Women will be



Violence Statistics

- **Homicide is the leading cause of death among pregnant women in the United States.**
- **In Kentucky, 1 in 9 women have been raped.**
- **In 2000, the number of women shot and killed by an intimate partner equaled nearly one woman every day.**
- **Domestic violence is the most common cause of injury to women age 15 to 44.**
- **Intimate partner violence has been associated with headaches, back pain, seizures, central nervous system disorders, chronic stress, irritable bowel syndrome, appetite loss, and viral infections.**

established this year in the College of Medicine. Jordan credits Dean Jay Perman with influencing the selection of the College of Medicine as the academic home for the center's first endowed chair. "His support has been substantial, and his insightful understanding of the impact of violence on women's health has been a great asset to our effort." The center's second chair will address women's mental health. The other chairs will focus on children who witness violence, on the multicultural study of violence against women, and on forensic mental health.

The center also conducts its own research projects. (See page 10 to learn how one of these projects, the 2004 Women's Safety Study, had immediate impact on women at UK.)

A second study under way is analyzing trends in the issuance and service of domestic violence protective orders over the past decade. Jordan leads a third study, with Jim Clark, the associate dean for research in the UK College of Social Work, Bob Lawson in the College of Law, and Jonathan Golding in the Department of Psychology, that is investigating patterns in sentencing and parole board decisions in cases where victims of domestic violence kill the offender.

Jordan is also partnering with Tracey Corey, Kentucky's chief medical examiner, on a fourth project to explore patterns of homicide in cases of intimate partner violence through a review of autopsy records of women who have been murdered.

While acknowledging the importance of these studies, Jordan emphasizes that the center's efforts at research go beyond its own studies. "If this center is the only unit on campus generating research related to violence against women, somebody ought to pack up my office and send me home, because I will have dismally failed at this job," Jordan says emphatically. "It's just as important for us to facilitate research by key faculty across campus as it is to do our own." The center's grant program has funded 11 faculty projects.

The center also sponsors scholarship: it is developing a graduate certificate, discipline-specific coursework, and currently employs four grad students in its research projects.

"The center's mission is to advance research and graduate education on violence against women. What that means is we want to see state-of-the-art research move from the campus to the community—to the hands of the judge making a decision about probation for an offender, the therapist comforting a child, the doctor examining a patient, the police officer showing up at the scene of a domestic dispute.

"Because in a very real way," Jordan says, "what our UK faculty explore and discover can be lifesaving. This is an exhausting and emotionally draining field to be in because you're exposed to some of the most horrific cruelties that one person can perpetrate on another. But you also see the amazing resiliency of women and children. Violence clearly changes a woman's life, but it need not ruin it. And as researchers and educators, we can play a role in ensuring it doesn't.

"I remain, after 23 years in the field, a hopeless optimist."

Estrogen: Protecting the Brain against HIV and Fighting Cardiovascular Disease

Women's health research at UK ranges from bedrock topics—like pregnancy and breast cancer—to new fields, such as estrogen and HIV infection, and brain activation across the menstrual cycle. Tom Curry, director of the UK COBRE in Women's Health, says the innovative research of two young faculty, who transitioned from the BIRCWH program to the COBRE program (see p. 14) and are now well on their way to establishing long-term research careers, is answering and revealing new questions in areas that have yet to be explored.

Melinda Wilson, who earned a Ph.D. in molecular biology at Loyola University, says, "I came here from Chicago, eight years ago, to work with Phyllis Wise [a physiologist and the first COBRE director], looking at how estrogen protects the brain against stroke injury," Wilson says. She spent three years as a postdoc and two years as a research associate in Wise's lab.

In September 2005, the COBRE grant was renewed for five years to a tune of \$10.3 million—the largest single grant ever awarded to UK in the area of women's health.

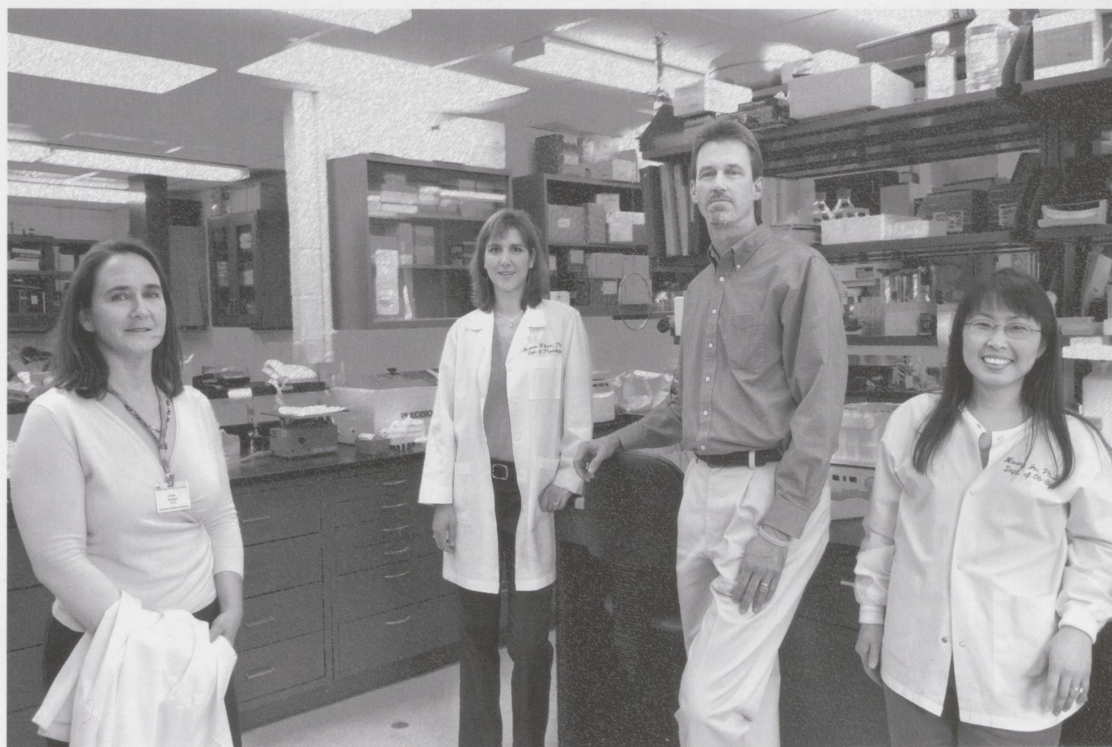
Wilson still focuses on estrogen, but today she's investigating how estrogen may protect the brain from HIV proteins, as well as the role estrogen plays in the cardiovascular system. She ventured into both of these areas because of research relationships fostered by COBRE.

"When HIV gets into the brain, it doesn't infect neurons directly," explains Wilson, now an assistant professor in physiology. "It enters the glial cells [cells that surround each neuron and provide protection and nourishment], which then release toxic proteins that can cause neuronal injury and may ultimately lead to HIV-associated dementia." She

adds that with antiretroviral therapy, people live longer than they used to with the disease, but people with long-term HIV infection have a high likelihood of experiencing some sort of cognitive impairment—ranging from subtle memory loss and personality disruptions to severe dementia.

"We know that estrogen plays an important role in protecting the brain and maintaining normal neuronal activity. When postmenopausal women lose estrogen, they become more susceptible to Alzheimer's and other neurodegenerative diseases. At the moment, there is no strong data that women are more protected against HIV-

COBRE's next generation: (from left to right) Jane Joseph (anatomy & neurobiology), Melinda Wilson (physiology), Michael Kilgore (molecular & biomedical pharmacology), and Misung Jo (obstetrics & gynecology). Joseph is tracking brain activation across the menstrual cycle. Wilson is studying the ways in which estrogen protects the brain against HIV and fights cardiovascular disease. Kilgore is exploring how the peroxisome proliferator-activated receptor (PPAR) and the estrogen receptor regulate fertility and reduce breast-cancer risk. Jo is studying the molecular mechanisms involved in ovulation, findings that may lead to better diagnostic tests, more effective contraception and new methods to boost fertility.



associated dementia, because clinical data has been limited. This is an emerging field."

Most of her HIV studies use human cells, and she says, "COBRE funds helped tremendously in outfitting a special, dedicated HIV lab. This is where Annadora Bruce-Keller (who leads the COBRE HIV team), Eric Smart and I can do experiments using live viruses," Wilson says, adding that such activity is critical. "You have to perform experiments showing that, under conditions of real HIV infection, the things we are testing actually happen in human cells."

Wilson points out, "I may have never made the connection between estrogen, HIV and cardiovascular research had I not been part of the COBRE. Eric Smart, who leads the COBRE cardiovascular team, had an interest in the gender differences he was seeing in heart disease, so we started collaborating. That work led to my own grant, funded by the National Heart, Lung and Blood Institute, looking at the effects of estrogen on cholesterol accumulation under conditions that induce atherosclerosis—narrowing and hardening of the arteries.

"This collaboration, the start-up funds that gave me my start as a faculty member, and mentoring are all ways I've benefited from COBRE. The opportunities for professional development have been very beneficial—and not just from faculty directly over me on paper, but the whole COBRE group," Wilson says.

continued on p. 16

Career Building at UK

In 2005, UK received renewal funds for an additional five years for two multi-million-dollar training programs for junior scientists.

The first program, Building Interdisciplinary Research Careers in Women's Health (BIRCWH), which began in 2000, was awarded \$2.5 million by the National Institute on Drug Abuse in September 2005. "We're in elite company," says Director Jef Ferguson. BIRCWH awards went to 11 universities, including Harvard, the University of California (Davis, Los Angeles and San Francisco), and the University of Michigan-Ann Arbor.

Ferguson, chair of UK's OB/GYN department, which ranks 15th in NIH funding to public medical schools, says the success of the renewal is a testament to the achievement of the BIRCWH scholars. These scholar-researchers brought in \$7.7 million in extramural funding in the last five years. The program's goal is to provide state-of-the-art training in women's health to ensure scholars successfully establish research careers.

"The program benefits scholars by providing a mentor/protégée relationship with a senior-level researcher—someone who is ready to give a young investigator pointers on developing a hypothesis and designing a project." Fostering the careers of young researchers is obviously close to Ferguson's heart. While he talks about the BIRCWH program in his office down the hall from the high-risk pregnancy clinic where he sees patients, he calls out to several OB/GYN residents passing in the hallway, confirming appointments on a friendly first-name basis.

BIRCWH includes coursework in things like research ethics, statistics and clinical trial design, and scholars receive salary support, are eligible for seed grants to jump-start their research, and 75 percent of their time (up to three years for those with clinic-oriented projects and two years for those with basic science projects) is protected to work on their mentored research project.

"One of the biggest challenges new investigators face now is availability of NIH funding. More dollars are going into the important area of bioterrorism, which leaves less funding for investigator-initiated grants. Say I'd like to study the effects of diabetes on fetal nourishment. There's less money now for that kind of study," Ferguson explains.

"The difficult thing is to keep recent graduates who want investigative careers from getting discouraged, and one way BIRCWH can do that is through salary support that allows these folks to put together preliminary data, build collaborations with other researchers, and sharpen their research skills so the junior scientists look better to the NIH when they apply for grants."

BIRCWH is targeting research in four areas: drug abuse and its relationship to gender differences, cancer as it relates to women's health,

hormonal regulation across a woman's lifespan, and the impact of oral health on pregnancy and cardiovascular health.

Current BIRCWH scholars include Joan Griffith (pediatrics), Joseph Holtman (anesthesiology), Susan Modesitt (OB/GYN), Leigh Ann Simmons (family studies and health services management), James Temprano (internal medicine), and Anand Vaishnav (neurology).

And three BIRCWH graduates—Melinda Wilson (p. 12), Jane Joseph (p. 16) and Michael Kilgore (who studies breast cancer)—are now stand-out researchers in the second of UK's multi-

million-dollar training programs: the Center of Biomedical Research Excellence (COBRE) in Women's Health.

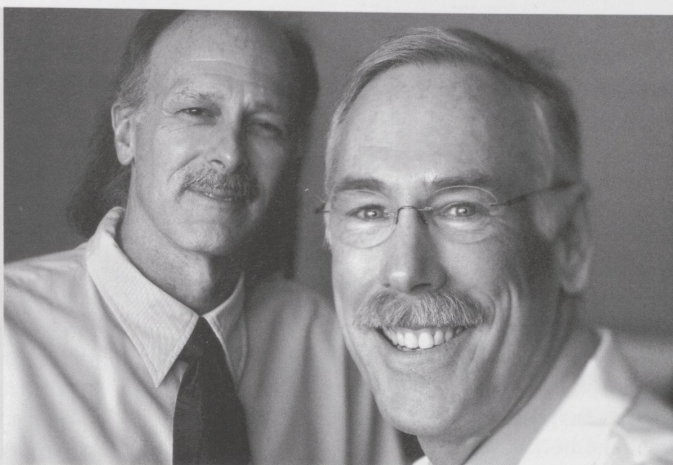
"COBRE is a prestigious NIH-sponsored program, and UK was fortunate to get funded on the first try," says Director Tom Curry, noting that UK landed one of 19 COBRE awards nationwide in 2000.

"Phyllis Wise spearheaded this entire effort," he says. A physiologist with expertise in the neuroprotective effects of estrogen, Wise left UK for the University of California-Davis in 2002. "Phyllis is an outstanding scientist. She is extremely articulate and was a very strong figure to lead this program," Curry says. "Whereas, when you get a middle-aged man talking about women's health," he pauses and laughs, "it's like Dr. Ruth. It just doesn't work quite as well."

In September 2005, the COBRE grant was renewed for five years to a tune of \$10.3 million—the largest single grant ever awarded to UK in the area of women's health.

"The center really has two aims: first, to promote our understanding of gender-based differences and how they impact the heart and brain, and, second, to mentor young, junior faculty to become successful scientists," says Curry, vice chair of research in the OB/GYN department.

And has COBRE worked? "It's been a good recruitment tool," Curry says, gearing up for a simile. "It's like Tubby Smith and basketball. Once you build a program and it has a reputation, it's easier to attract people and keep



Tom Curry (left) directs COBRE and Jef Ferguson directs BIRCWH, training programs for young research faculty in women's health. "When you think of a specialty area in medicine that is synonymous with women's health, OB/GYN is a natural because all we do is take care of women," says Ferguson, who serves as chair of obstetrics and gynecology at UK. Curry is vice chair of the department.

people here. Of course in today's academic world, as junior people become successful, they tend to get offers and go elsewhere. That's part of the success—which is a good thing—but it's also deleterious because you lose good junior faculty." In his 20-year career at UK, Curry himself has had other offers, but he's stayed here because "it's a very cordial, collegial and intellectual environment."

And, he adds, it's the right place to do his work. "The COBRE grant has greatly increased the visibility of women's health research at UK. COBRE has promoted women scientists on campus, and our junior faculty have generated about \$10 million in extramural funding."

Curry sums up COBRE's project areas by team leader: Eric Smart ("the effects of estrogen and testosterone on heart disease"), himself ("how the egg gets out of the ovary and how hormones affect ovarian function"), Annadora Bruce-Keller ("how pregnancy hormones protect against the progression of HIV"), Lothar Jennes ("how estrogen and antidepressants impact neuron regeneration in the brain"), and Tom Kelly ("how estrogen and progesterone affect cognitive function").

Tracking Brain Activation across the Menstrual Cycle

Jane Joseph, who has been part of the COBRE team since 2001 and has grants from the National Institute of Mental Health and the National Science Foundation, is an assistant professor in the anatomy and neurobiology department, but was trained as a psychologist. "My focus was cognition—perception, memory, language," she explains. "During my postdoc training at Georgetown University, I got into functional magnetic resonance imaging, or fMRI."

Joseph is using fMRI for an innovative study of women's cognitive function during a high-estrogen point and a low-estrogen point in their menstrual cycles. And the preliminary results are intriguing.

"fMRI is a lot like getting a routine medical MRI scan—you lay down and your head is in what looks like a cage. Our study participants had a screen in front of their eyes, connected to the cage. We sent images to that screen from a computer in the control room, and the women pushed buttons on a glove-like device so we could record their performance on two tasks."

The first task tested spatial cognition. Joseph calls it mental rotation, and it's something most people have seen on a standardized test. "You have a 3-D figure on the left, and you have to pick the one of three other figures that matches it. You have to rotate it in your head," she explains, then pauses. "I want to be careful how I phrase this, but men tend to complete more of these kinds of tasks and get them correct than do women in a timed version of this test."

"Now, that's not to say no women do well—it's just an average gender difference that's been supported by years of research on pencil-and-paper tests. Some researchers have shown that women do just as well as men if the test is not timed. My thinking is that such a difference is not neces-

sarily bad—women may just be adopting different strategies than men."

She explains that the second task tested working memory. "This task involved looking at a sequence of letters, shown one at a time for about 4 seconds each. When each new letter appeared, participants had to decide whether that letter matched the previous letter or the letter shown two time slots before. They also had to keep the current letter in memory because they needed to make this decision each time a letter was presented. I think it's pretty hard."

Why test memory? "Sex differences haven't been studied as much with this type of task, but women on hormone replacement therapy have been shown to perform better on other kinds of memory tests, so we wanted to see if high-estrogen levels correlate with better performance."

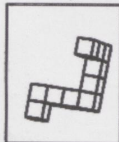
In both of these tasks, Joseph's goal was to find out what area of the brain was activated and if that changed during the menstrual cycle. "Other studies had produced some evidence that performance varies over the menstrual cycle, but these were subtle differences. So when I got into this, it was pretty controversial stuff."

The vital part of this study was determining the estrogen levels in her nine study participants. "Tom Curry's group helped us by doing blood assays to test these levels, and Tom Kelly (who leads the COBRE cognitive function team) was instrumental in guiding the design of this study to capitalize on the high- and low-estrogen phases." The biggest challenge for Joseph's team was scheduling women to come in during two different three-to-five day windows during their menstrual cycle.

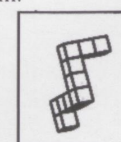
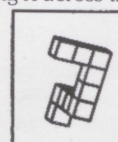
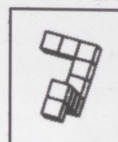
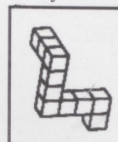
What did she find? Joseph says these are loose correlations because she didn't manipulate estrogen levels by having the women take drugs, but her results indicate that on tasks in which men typically out-pace women, like the mental rotation task, brain activation is more extensive when estrogen is low.

This example, from pencil-and-paper tests, shows the mental rotation task. Jane Joseph used a similar task in her brain activation study of nine women.

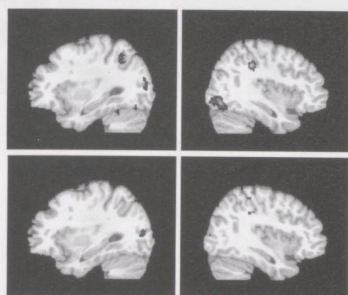
Now look at this object:



Two of these four drawings show the same object. Can you find the two? Put a big X across them.



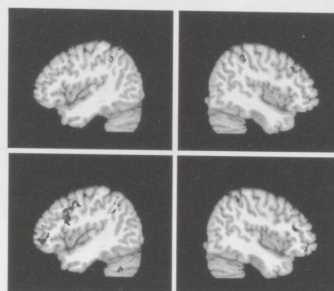
Mental Rotation



low estrogen

high estrogen

Working Memory



low estrogen

high estrogen

Jane Joseph's fMRI brain scans reveal that for the mental rotation task, brain activation (shown by the dark areas) was more widespread during the low-estrogen phase of the menstrual cycle. The opposite was true for the working memory task—brain activation was more extensive when estrogen was high.

"The opposite occurred for the memory task," Joseph points out, pulling up a different set of brain scans on her computer screen. "When women had higher estrogen levels, they showed more extensive brain activation doing the memory task than when they had low estrogen."

What does this mean? Joseph says her results aren't finalized yet, and, with only nine participants, this was a small sample of women. But Curry says, "This is an intriguing way to tell a story of how hormones affect cognitive behavior. We have to be careful about jumping to conclusions about cognitive processing changing across the menstrual cycle. Should it impact when you take your SAT or GRE? You open Pandora's box with the possible implications. But these are interesting and relevant questions to study."

"Down the line, these studies and our other basic science projects may lead to important clinical treatments for women," says Curry. "Leslie Crofford, Sara Jo Nixon, Carol Jordan, Jef Ferguson, and I are all asking, 'How can we take the things we're working on and translate them into patient care for people locally and nationally?' We're critically interested in moving to the next level—merging basic science and clinical science to make a long-term impact on women's health." ■

Learn more:

Building Interdisciplinary Research
Careers in Women's Health (BIRCWH)
www.mc.uky.edu/bircwh

Center of Biomedical Research
Excellence (COBRE) in Women's Health
www.mc.uky.edu/cobre

Center for Research on Violence
Against Women
www.research.uky.edu/crvaw

Center for the Advancement
of Women's Health
www.mc.uky.edu/womenshealth

Kentucky Women's Health Registry
www.kywomensregistry.com
859-323-5709 or 1-800-929-2320

Enlisting **Blackberries** in the Fight against Cancer

By Robin Roenker

Russell Mumper, vice chair and associate professor of pharmaceutical sciences at UK, likes to start his mornings with a bit of blackberry jam at breakfast. Beyond the simple fact that it tastes good, that dose of blackberries may help his body ward off cancer, fight inflammation, and—perhaps—prevent oxidative brain damage that may contribute to Alzheimer's disease.

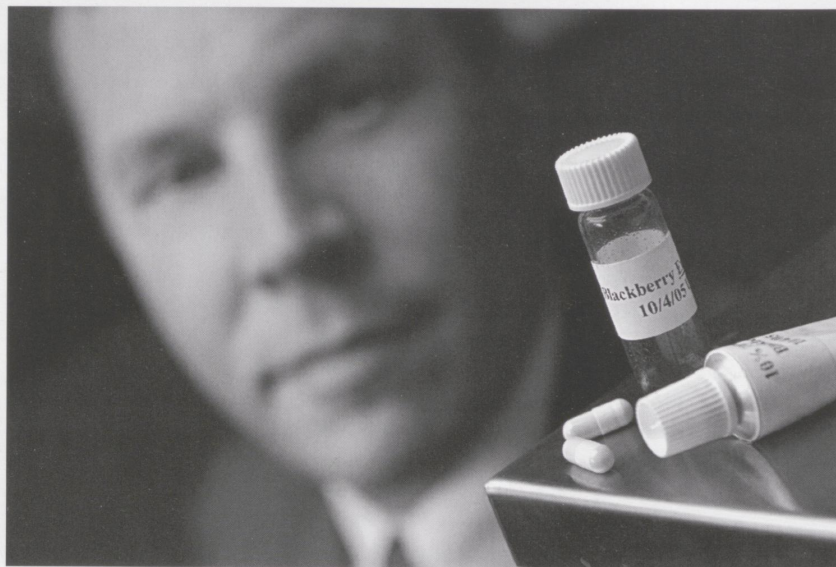
We all know that fruits are good for us, but only in the last decade or so have researchers begun to uncover the secrets of *why* and *how* fruits like the blackberry work their healthful magic—and exactly how far-reaching the benefits may be.

The blackberry's disease-fighting properties may be energized by a class of compounds called anthocyanins, which have antioxidant and anti-inflammatory properties, explains Mumper. "Anthocyanins are produced only in land-based plants, fruits and vegetables. They don't occur naturally in our bodies. We think that vegetation and fruits produce these compounds to protect themselves from UV sun damage." And while all fruits and vegetables contain anthocyanins, the concentration in berries—especially raspberries and blackberries—is particularly robust.

Mumper's previous research focused on the anti-cancer properties of black raspberries to treat and prevent oral cancers, and that work is ongoing in clinical trials. But last April an invitation to collaborate from Paige Shumate Short of the Carlisle, Kentucky-based WindStone Farms, the state's largest blackberry grower, caused him to think more broadly about berries.

It's a Kentucky-grown partnership that Mumper is intensely proud of. A Wisconsin native, he adopted the Bluegrass State as his own during his years as both an undergraduate and graduate student at UK. What sets this

Blackberry extract has promising anti-cancer potential. Russell Mumper is developing an oral capsule and skin cream that he hopes will eventually receive FDA approval to treat or prevent colon cancer and skin cancer, respectively.



Russell Mumper, vice chair and associate professor of pharmaceutical sciences at UK, talks with Paige Shumate Short of the Carlisle, Kentucky-based WindStone Farms, the state's largest blackberry grower. It's a Kentucky-grown partnership that may lead to new discoveries about the disease-fighting properties of the blackberry.



research apart from other work to create plant-derived products, he says, is that "all of the intellectual horsepower as well as the berries come from one place: right here in Kentucky."

A New Recruit in the Battle Against Cancer

How powerful is the simple blackberry in battling cancer? To find out, Mumper introduced blackberry extract into colonies of colon cancer cells in vitro. "Under normal conditions, these cells grow at a steady rate, doubling almost every day," Mumper explains. "So, the question we were asking was, can this blackberry extract inhibit the growth rate of these tumor cells?"

In Mumper's preliminary tests, blackberry extract—formed by taking WindStone's whole blackberries, removing the water, freeze-drying what remains, and then using ethanol and hydrochloric acid to target and pull out the anthocyanins—stopped the growth of colon cancer cells. Mumper and other scientists believe that the anthocyanins deter cancer growth by both acting as antioxidants to scavenge harmful free radicals and by inducing programmed tumor cell death.

Whether the blackberry extract can prevent cancer cells from growing in the body or treat already-formed cancer is not yet known. That's one of Mumper's next research questions.

Either way, though, the anthocyanin-rich blackberry extract clearly has promising anti-cancer potential. Mumper is developing both a blackberry extract oral capsule and a blackberry extract skin cream that he hopes will eventually receive FDA approval to treat or

prevent colon cancer and skin cancer, respectively. He has developed a prototype of the skin cream and is testing its effectiveness in preventing sun-induced skin cancer in mouse models through research with John D'Orazio, assistant professor in the Department of Pediatrics and the Markey Cancer Center.

But the blackberry's potential applications don't stop with cancer. Mumper's team has been investigating uses for anthocyanins' anti-inflammatory properties as well. Mumper will soon begin work to develop a blackberry capsule to treat inflammation of the gastrointestinal tract, such as Gastroesophageal Reflux Disease, Crohn's Disease, ulcerative colitis, and inflammatory bowel disease. And in topical cream form, the blackberry extract could also be targeted to treat inflammation of the skin, such as psoriasis and eczema. Mumper is also working with Leslie Crofford, chief of UK's Division of Rheumatology, to investigate the blackberry's potential to prevent inflammation associated with arthritis and to accelerate wound healing. (For more on Crofford, see p. 2).

And Mumper has recently added another research partner at UK. He's joined efforts with Allan Butterfield, director of the Center of Membrane Sciences, to determine whether the anthocyanin-rich blackberry extract, by blocking a particular type of oxidative stress and neurodegeneration in the brain, can prevent the onset of mild cognitive impairment, which can lead to Alzheimer's disease.

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Kentucky's Grape and Wine Industry Bursting with Potential

Last year Chris Nelson, an associate professor in UK's Division of Pediatric Infectious Diseases and owner of Chrisman Mill Vineyards and Winery, contemplated planting some additional acres of a Cabernet Sauvignon grape variety. But he changed his mind after a visit from Kaan Kurtural, a UK expert on the cultivation of grapes for winemaking. Based on the topography and soil at Nelson's Jessamine County vineyard, Kurtural, who joined the College of Agriculture last July, steered him away from planting additional vinifera, or European-variety grapes. Instead, he encouraged Nelson to plant an American grape variety called Norton, which Kurtural believed would grow better there.

In hindsight, it's a decision Nelson is pleased with. "The long-term viability of Norton is where Kentucky's wine industry is going," he says.

Helping growers and wineries in the state realize the potential of Kentucky's grape and wine industry—and how they can most successfully play a part in it—is precisely the goal of several extension research projects being overseen by John Strang, an extension professor in

UK's Department of Horticulture.

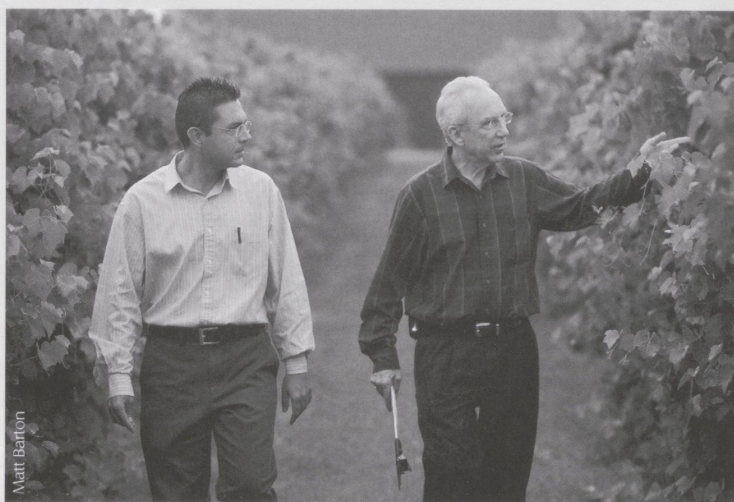
Thanks to a \$585,000 grant from the Kentucky Agricultural Development Board, obtained through the efforts of the Kentucky Grape and Wine Council, the Kentucky Vineyard Society, and the Kentucky Department of Agriculture, Strang was able to hire both Kurtural and Tom Cottrell, an extension enologist, on two-year appointments. (Enology is the science of winemaking.)

While Kurtural's primary focus is helping Kentucky grape growers select the optimal variety for their particular sites, Cottrell's is visiting Kentucky's 24 operating wineries, tasting their wines, and suggesting ways to improve them. "My work with the winemaking aspect is pretty straightforward stuff," he says, belying the wealth of expertise he brings to Kentucky. He has begun and operated wineries in Pennsylvania, Rhode Island and California.

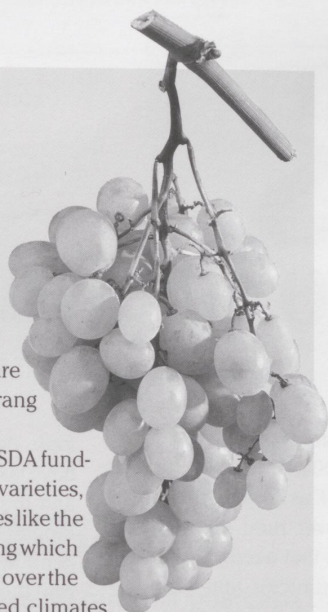
The statistics speak to the boom under way in Kentucky's wine industry. In 1998, there were only 40 acres of wine grapes in commercial vineyards in the state; today, 102 growers across the state cultivate approximately 500 acres of grapes. In 2003, Kentucky wineries produced 24,000 cases of wine, and this year they will bottle more than 61,000 cases.

As fast as the growth has come, it would be tempting for the state's wineries and vineyards to keep putting the bulk of their energies into European grapes and wines, like Chardonnays or Cabernet Sauvignons that tend to bring the most revenue per acre. But, as Strang points out, while these grapes thrive in California, they are very difficult to grow here in Kentucky. One extreme winter could potentially wipe out the state's entire crop.

"We're way over-planted in those, as far as I'm concerned. Thirty-seven percent of all the Kentucky acreage is planted in vinifera varieties. And none



Kaan Kurtural (left), a UK expert on the cultivation of grapes for winemaking, and Tom Cottrell, an extension enologist, are helping Kentucky grape growers select the optimal variety for their particular sites. Enology is the science of winemaking.



of the surrounding states are anywhere close to that," Strang says.

Strang and Kurtural, with USDA funding, are testing other grape varieties, particularly American varieties like the Norton, in hopes of determining which ones will be most sustainable over the long term in Kentucky's varied climates. Kurtural explains that while some vinifera varieties do grow fairly well in Central Kentucky, they are not appropriate for sites in other parts of the state.

Kurtural spends much of his time traveling to grape-growing sites like Chrisman Mill to determine their suitability, but his overall diagnosis of a site involves technology beyond his in-person visit. Having developed a program that utilizes geographic information system (GIS) technology, Kurtural can now type in an address of a vineyard or potential vineyard and within minutes have electronic access to key information—such as temperature trends and topography—that helps him determine, first, if that site is suitable for planting grapes, and, second, which varieties might thrive there.

Kurtural says that "we can grow grapes in essentially all parts of the state," but the ideal site is one that is slightly more elevated than the surrounding areas, with a 5 to 10 percent slope and a north-facing aspect, to mitigate the damages of spring frost and delay "bud break" in spring. Also, while Kentucky's limestone-based soil suits the grapes well, there must be at least 30 inches of rooting depth, good drainage, and a good balance of potassium, phosphorous and other nutrients available.

Cottrell says that Kurtural's role—helping growers choose appropriate sites—will be pivotal as Kentucky works to catch up with surrounding states like Missouri, Indiana and Ohio that have had thriving wine industries for more than 30 years.

"Raising grapes in new places is fraught with uncertainties. Kaan and Tom are using their expertise to help Kentucky growers select varieties that will thrive as well as make premium wine," says Strang.

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Enhanced Delivery

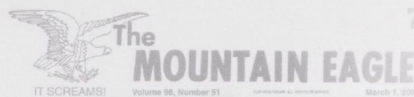
While grabbing a bowl of blackberries or a spoonful of jam is one easy way to introduce the many benefits of anthocyanins into your system, it isn't the most efficient way of doing so, Mumper says.

"When you eat a berry, its anthocyanins are digested quickly and relatively little is absorbed," Mumper explains. "In contrast, the blackberry extract oral capsule we envision will offer targeted delivery to the gastrointestinal tract." Encapsulated with a specialized polymer coating designed to dissolve only at a pH specific to the colon, the stomach, or the small or large intestines, the capsule's anthocyanins will be delivered directly to a specific site, depending on the disease or condition being treated.

"We believe that success will be in the formulation and delivery of the blackberry extract," Mumper says. "If you were to rub a scoop of WindStone Farms' blackberry jam right into your skin," he says, grinning, "the jam would just sit there and your skin would turn purple. But when the blackberry extract is formulated in a topical cream, the purple-red-colored anthocyanins are readily absorbed."

FDA approval of the various medical applications for the oral capsule and skin cream will require lengthy additional testing and clinical trials, and still may be five to eight years away. But these products could be available over-the-counter as a dietary supplement and cosmetic much sooner—perhaps even within the next year or two, Mumper estimates. He and Short have formed a private company, Four Tigers LLC, to develop novel blackberry products and to promote the blackberry industry in the state. They also hope to have a blackberry extract chewing gum and lip balm on the market soon.

In the meantime, Mumper will keep reaching for his blackberry jam every morning. "I don't want to sound like a commercial," he says, "but the jam tastes great, and I know I'm doing something that's clearly good for me." ■



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March 1, 2005

TELLING THE STORIES THAT NEED TO BE TOLD

Thursday ♦ January 27, 2005
Harlan Daily Enterprise
harlandaily.com

U.S. helicopter crashes in Iraq

...and more than 1,400 on deadliest day since war began
...the helicopter was carrying a wounded soldier and a medic
...the crash occurred in a heavily contested area
...the helicopter was shot down by Iraqi forces
...the crash occurred in a heavily contested area
...the helicopter was shot down by Iraqi forces

By Robin Roenker

Al Cross learned an important lesson at baseball games when he was 11 years old. He thought it was about keeping score, but it turned out to be about journalism. As official scorer for the Little League in his hometown of Albany, Kentucky, he had to determine whether to score a batted ball as a hit or an error. "Because an official scorer makes both batter and fielder happy when he scores a hit and makes them both mad when he scores an error, I learned how to defend unpopular choices, which turned out to be good preparation for journalism."

This experience served him well in his 26-year career at the Louisville *Courier-Journal*, 15 of it as the chief political writer. Now, through UK's Institute for Rural Journalism and Community Issues, he hopes to share this message with other reporters throughout the country struggling to write stories of meaning to rural audiences: Call them like you see them. Report on the stories that matter, and report them accurately and well—no matter how controversial or complex the issues may be.

Creation of the institute was partly driven, Cross says, by the widespread buyout by large newspaper chains of rural daily and weekly papers in the 1980s and 1990s. "Many of them cut staffs and lost their focus on local issues. Stories on issues central to the sustainability of rural communities—on education, the environment, economic development, and health-

care—were simply going untold." So in August 2004, this institute was launched at UK as a way to reenergize and re-empower rural journalists to tell the stories that needed telling.

Cross, the director and only full-time employee, is a man who clearly loves his job, even if he has discovered that he's his own toughest boss.

"I give myself too much to do," he admits, sighing and leaning back in a chair in his office, which is an interesting mix of Kentucky scenes and political journalism. A picture of a tobacco field hangs on the wall alongside the first issue of the *Wayne County Out-*

look, dated from 1904. Newspapers have taken up residence everywhere, and the bookcases are stacked with biographies of political icons like Eugene McCarthy and Richard Nixon. And there, helping to prop up Nixon, is *Politics for Dummies*.

But back to Cross's maniacal schedule. "I see all these things that people would like me to do, and I *want* to do them, because I think they need doing." These "things" range from sponsoring statewide and regional journalism and policy conferences on thorny topics such as the environmental and economic impacts of coal to inadequacies in education and healthcare—issues that have long challenged rural America, and Appalachia in particular—to launching the *The Rural Blog*, an online source sheet for covering stories shaping rural America, and conducting research on content and ownership of rural papers.

And while Cross feels that shedding journalistic light on the issues facing rural America is of key importance, he doesn't want the institute to take sides. "We are advocates for the debate and for the examination of issues," he says.

MOVING OUT OF THE SANDBOX

The idea for the institute began in late 2000, when Rudy Abramson, who had covered stories on Appalachia as a correspondent for the *Los Angeles Times* and who is editor of the newly

The institute was formed in part, Smith says, in reaction to "the Wal-Marting of Main Street in America"—the loss of small-town ownership of local news media, banks and retail establishments to large conglomerates.

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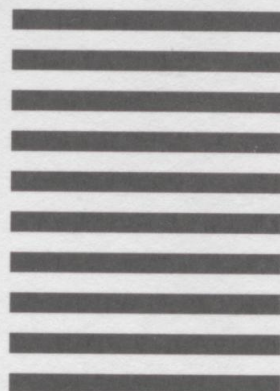
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Coalfield PROGRESS

Authority usurped, school board says

To seek AG ruling on county action

Several members of the Coalfield School Board have filed a lawsuit with the Kentucky State Office of Education, claiming that the county board of education has usurped their authority.



Board initiates lawsuit

released *Encyclopedia of Appalachia*, and Kentuckian Al Smith, longtime newspaper editor and host of Kentucky Educational Television's political show *Comment on Kentucky*, shared their mutual concern about what they saw as the declining quality of rural newspapers.

They agreed something needed to be done to combat the ill effects of what Smith calls "the Wal-Marting of Main Street in America"—the loss of small-town ownership of local news media, banks and retail establishments to large conglomerates.

With UK President Lee Todd's approval and support, Smith worked to incorporate the solution he and

Abramson—and by this time, Cross and others—had envisioned: a multidisciplinary and multi-institutional center, which, according to Cross, is unique in the country. "Nobody else has a center to address the problems of rural America through journalism," he says.

Having secured \$250,000 in initial funding from the John S. and James L. Knight Foundation, \$50,000 more from the Ford Foundation, and pledges of "academic collaboration" from six or seven universities in Appalachia or states that border Kentucky, the institute was open for business. But Cross makes it clear that he isn't running a writing institute. Its focus is not on the

INSIDE: Volleyball team captures district crown—Sports

Mt. Sterling Advocate

50¢

Johnson using Internet to reach today's youths



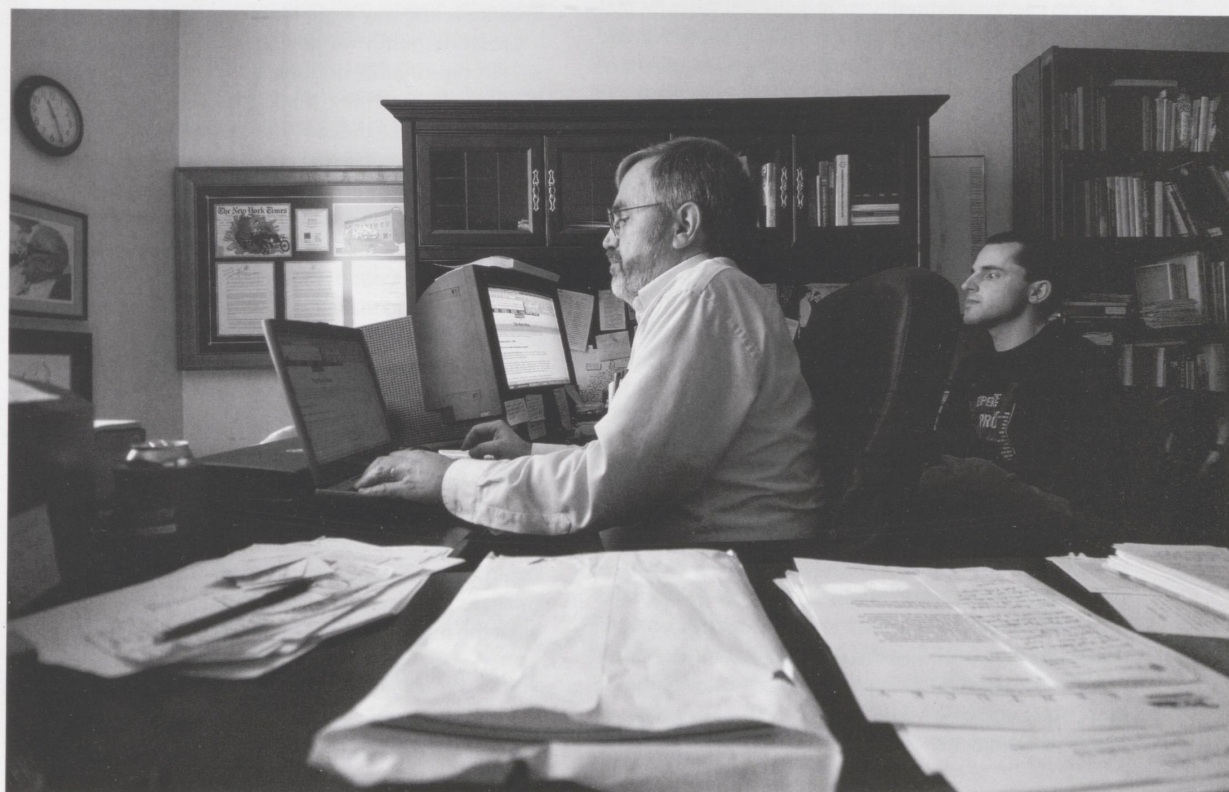
Changing Court Days discussed by council

One idea: selling Friday, not Monday

Vendor: It's like a family reunion

finer points of spinning out strong journalistic copy; its mission is to share the ideas and policies behind the stories that need to be covered. "Of course, there will always be some element of craft in what we do. But the priority is to encourage and help

In his office at the UK College of Communications and Information Studies, Al Cross works with Chas Hartman, a second-year master's student in journalism. They meet daily to edit *The Rural Blog*, an online source sheet for covering stories shaping rural America.

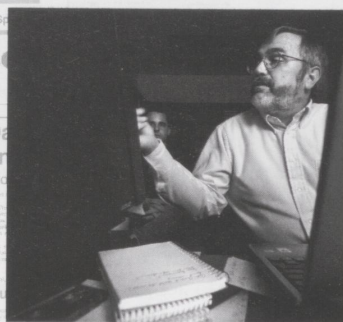


"Our message to reporters throughout the country struggling to write stories of meaning to rural audiences is

this: Call them like you see them. Report on the stories

that matter, and

report them accurately and well—no matter how controversial or complex the issues may be."



we look at it geographically. Central Appalachia was the sandbox. We had to learn how to crawl around in the sandbox before we could start walking around in the yard. So, if Central Appalachia is the sandbox, then Kentucky and the greater Appalachian region are the yard. And the rest of the country is the street."

A WAY TO RUB SHOULDERS

Abramson says one simple fact has already helped the rural institute to be successful: it is located within a university. Both he and Smith emphasize the role that colleges and universities can play in advancing the academic and social welfare of the rural communities surrounding them. And both hope that the center can help rural journalists serve as ready conduits of information between communities and their local colleges.

"In turn, a lot of these smaller colleges need to better learn how to make use of the media to share the work that they're doing," says Abramson, who serves as chair of the institute's national advisory board. "It's all about forming partnerships and strengthening collaborations. And the institute is one way to do that."

Cross is currently working to raise \$750,000 in funding, which could then be doubled both through private donations and a matching fund from the state for a total endowment of \$3 million. The money would be used to expand its outreach and teaching capacity, cover the long-term operating costs of the institute, and to hire additional staff. And Cross would eventually like to establish web-based training modules available to journalists throughout the country. "Three million is really the minimum we need to make this a truly national program that does what needs to be done," says Cross.

Again, he's talking about things that need to be done. But he pauses to admit, with a satisfied smile, that the center is already making important headway into some of them.

"The defining characteristic of rurality is isolation. And I know from personal experience that there are thousands of good rural journalists in America. Or those that could be good. They don't get a chance to rub shoulders or share ideas with people like themselves. And that's what the institute is here to do." ■

**FOR MORE, VISIT
WWW.RURALJOURNALISM.ORG**

journalists who write about issues facing rural America."

And while the center, because of its location at UK, may always retain a particular interest in rural Appalachian issues, one of Cross's main goals is growing its focus to encompass rurality more generally. Already, that is happening, thanks in large part to the institute's online Rural Blog, which is now regular reading for hundreds of journalists who cover rural issues.

Jennifer Brown, a reporter with the *Kentucky New Era* in Hopkinsville, found the blog to be instrumental in helping localize her story about the tobacco buyout program last year. "Thanks to the blog, I was able to find a source of buyout recipients in my Kentucky coverage area, information I hadn't been able to access elsewhere," she says.

But her story is not unique. Cross hears praises for the blog—which encompasses story ideas and story sources for almost any issue facing rural communities today, from mining safety to methamphetamine addiction—daily. "I probably wouldn't have done the story otherwise," writes one contributor. "It wasn't even on my radar screen." And the accolades come from somewhat unexpected places, states like Oregon, Delaware and Colorado that have small rural populations.

But rurality exists in every state in the nation, explains Cross. "Fifty-five million Americans live in rural communities," he says, "and very few of those today are farmers."

Cross knows that taking on rural issues faced by the entire country will be daunting, but he breaks it down in terms that seem manageable, even fun. "Here's the way

Papyrus d' Herculaneum: Les décripter est devenu possible

French Magazine Features UK Work to Unwrap Damaged Manuscripts

In 79 A.D. Mount Vesuvius swallowed the cities of Pompeii and Herculaneum. In the 18th century, an ancient library in a Herculaneum villa yielded 1,800 papyrus scrolls that were so badly burned they looked more like lumps of charcoal than precious texts. Half of these scrolls have been read, but the other half will require space-age technology to decipher their secrets.

UK computer science professor Brent Seales has been working on just such a technology (see www.research.uky.edu/odyssey/fall04/seales.html). In July 2005, he gave a keynote address at the Friends of Herculaneum Society annual meeting in Oxford, England.

"My presentation had to do with how virtual unwrapping might be applied to the badly damaged scrolls from the Herculaneum site that remain unopened and un-read. At that meeting a reporter from *Science et Vie*—the French equivalent of *Scientific American*—interviewed me and subsequently worked with my team to include our experimental research in the article that appeared in November 2005."

Seales says this recognition was an honor and adds, "I can read French—enough to understand technical stuff. A new three-year NSF grant will boost the development of this technology, and I'm negotiating for access to the Herculaneum scrolls. There are several hundred scrolls that have yet to be opened. The Herculaneum collection would be our 'Holy Grail.'"

—Alicia P. Gregory

Carbon Nanotubes: Faster Flow, Greater Possibilities

UK researchers reported in the November 3, 2005, issue of *Nature* that fluids can pass through nanotubes at rates 10,000 to 100,000 times faster than previously thought.

The finding may speed the process of constructing highly efficient filters, which could be used in a variety of applications, including the manufacture of military uniforms that could filter out chemical and biological weapons, or the development of a more efficient nicotine patch for those trying to quit smoking.

The UK team—Bruce Hinds, Mainak Majumder and Nitin Chopra (chemical and materials engineering), and Rodney Andrews (Center for Applied Energy Research)—was the first to confirm the rapid flow, predicted by theorists in 2001.

—Keith Elkins

Osteoporosis Drug Can Prevent Breast Cancer

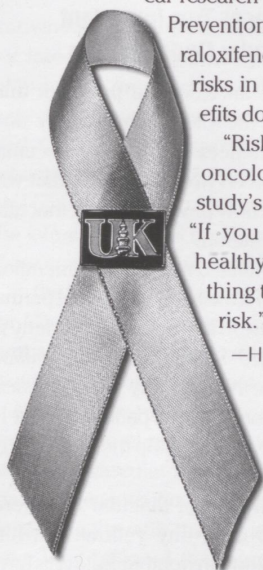
One of the largest breast cancer prevention trials ever conducted has revealed that the osteoporosis drug raloxifene (Evista®) works as well as the widely used drug tamoxifen (Nolvadex®) in reducing breast cancer risk for postmenopausal women. The study enrolled 19,747 postmenopausal women at increased risk of the disease; 62 women were enrolled at the UK Markey Cancer Center.

The National Cancer Institute (NCI) study showed both drugs cut the risk of developing invasive breast cancer in half. The women who took raloxifene daily, for an average of four years, also had 35 percent fewer uterine cancers and 29 percent fewer blood clots than women who took tamoxifen. Uterine cancers, especially endometrial cancers, are a rare but serious side effect of tamoxifen. Both drugs increase a women's risk of blood clots.

Leslie Ford, associate director for clinical research in NCI's Division of Cancer Prevention, says, "For many women, raloxifene's benefits will outweigh its risks in a way that tamoxifen's benefits do not."

"Risk is an important thing," says oncologist Edward Romond, the study's principal investigator at UK. "If you are giving something to healthy women, you want something that has the least amount of risk."

—Holly Staley



A Very Personal Bacterial Battle: *C. Diff* Killed UK Physician's Stepfather

UK's Richard Greenberg is one of many doctors around the country working to halt an aggressive and increasingly fatal bacterial infection called *C. diff*, but he has a personal reason for wanting to see the fight won.

His stepfather, who lived in Washington, D.C., died in 2005 from a severe case of *C. diff*.

Health officials say an aggressive new strain of the infection is causing a growing national health threat, producing fatigue, nausea, raging diarrhea and, in rare cases, death. *C. diff* outbreaks have been reported at hospitals in Canada and several U.S. cities.

A study of *C. diff* (formally known as *Clostridium difficile*) in a dozen Quebec hospitals in 2004 found an incidence of 22.5 cases per 1,000 hospital admissions and a mortality rate of 6.9 percent—rates that *The New England Journal of Medicine* recently called “strikingly high.”

Greenberg, an infectious diseases expert and a professor of medicine at UK, is helping test an experimental new vaccine that might protect patients against *C. diff* and prevent devastating relapses. Developed by Acambis Inc. in Massachusetts, the vaccine is designed to boost patients' natural immunity against the disease.

The infection has been striking increasing numbers of hospital patients who have received courses of powerful antibiotics. It is thought that these patients either pick up the bacteria in the hospital or already have *C. diff* in their bodies. Then, so the theory goes, the antibiotics they receive knock out helpful bacteria in the colon that normally would keep *C. diff* in check. Without them, the infection takes off.

People whose immunity is strong might escape with only a bout of diarrhea. Those with lower immunity might need repeated oral antibiotic treatments to control the infection and prevent relapses, Greenberg explains. In rare cases, severe, life-threatening infections develop.

“This is what happened to my stepfather. He had the diarrhea and lacked the innate immunity. He was treated too late: By the time it was recognized, his colon had been destroyed. They had to remove it, and he never recovered from the surgery.”

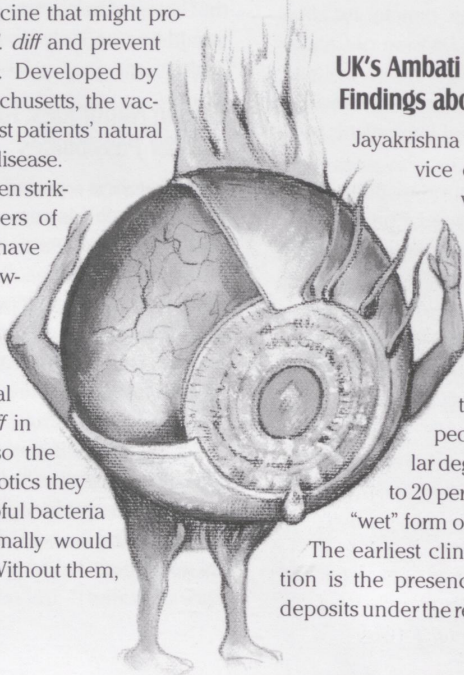
Greenberg says patients who develop severe diarrhea within a few weeks after spending time in the hospital or taking a course of antibiotics should call their doctor immediately. Greenberg plans to give the vaccine to healthy people to determine whether it boosts their natural immunity against *C. diff*. He hopes to recruit a small number of healthy patients over age 65, who would receive three injections of the vaccine at 28-day intervals. If things go well, the vaccine would be offered to patients who are infected with *C. diff*, he says. “Eventually, it might prove cost-effective to give the vaccine to all patients who are going to get any procedure in the hospital and who will be receiving antibiotics.”

UK's Ambati Announces Two Important Findings about Macular Degeneration

Jayakrishna Ambati, an associate professor and vice chair of the UK ophthalmology and visual sciences department, recently announced two discoveries that will impact how physicians treat macular degeneration.

Age-related macular degeneration (AMD) is the leading cause of permanent vision loss among the elderly in the United States, where 15 million people have the early “dry” form of macular degeneration. Of those patients, about 10 to 20 percent go on to develop the late-stage or “wet” form of the disease.

The earliest clinical indicator of macular degeneration is the presence of drusen, tiny yellow or white deposits under the retina. Although ophthalmologists have





The University of Kentucky held a building dedication for the new Center for Pharmaceutical Science & Technology at UK's Coldstream Research Campus on May 1. The \$17 million facility, hailed as the pharmaceutical manufacturing factory of the future, will provide state-of-the-art capabilities for new pharmaceutical analysis, formulation, and FDA- and DEA-approved sterile product manufacturing. The CPST has been operating at UK's College of Pharmacy since 1986 and has completed more than 200 development projects that have led to clinical trials. UK will continue to serve clients with non-sterile cGMP clinical supply manufacturing at the college site.



Robert "Bob" L. Williams (left), Messer Construction Company senior project executive, and Ken Roberts, UK College of Pharmacy dean, at the CPST Coldstream building dedication

known for some time that these deposits are a risk factor for late-stage AMD, it has been unclear what role they play in the progression of the disease. Drusen in AMD patients contain components known as complement C3 and C5. Ambati's research found that the presence of bioactive fragments of these components, known as C3a and C5a, are not only markers of AMD that will develop into the late-stage form of the disease, but that the presence of these components also stimulates the progression of AMD.

In the future, early-stage AMD patients could be screened for C3a and C5a to assess their risk for advanced AMD. Ambati's lab is currently testing substances to block these fragments to potentially treat "high-risk" drusen.

Ambati's second discovery focuses on angiogenesis—the formation of new blood vessels from pre-existing vessels—and vascular endothelial growth factor (VEGF). In macular degeneration, vessels grow through angiogenesis, destroying the cells that are required for vision. Scientists have long believed that turning off the source of VEGF would halt angiogenesis and disease progression.

Ambati's team found that while withdrawing VEGF could halt angiogenesis in some areas, it actually encouraged it in others. This previously unknown effect of VEGF was mediated through activating VEGF receptor 1 and deactivating VEGF receptor 2. Additionally, his team found that a compound known as SPARC (secreted protein, acidic and rich in cysteine) could route VEGF away from receptor 1. So, controlling SPARC levels appears to be the key to controlling angiogenesis in macular degeneration.

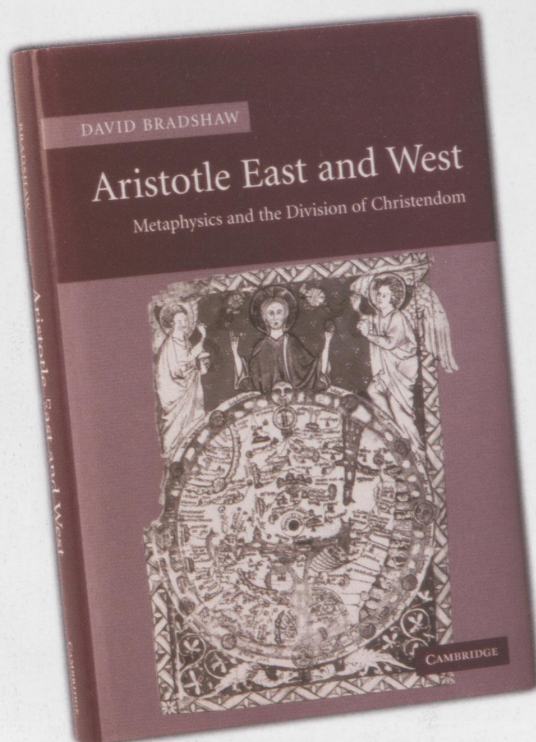
These findings have far-reaching implications because angiogenesis is also the process by which other growths spread in the body, including malignant tumors.

The February 14, 2006, *Proceedings of the National Academy of Sciences* published the drusen research, and the February 1, 2006, *Journal of Clinical Investigation* published the VEGF research. Both projects were supported by the National Eye Institute. ■

—Allison Elliot

Bringing Some Ancient Philosophy Up to Date

Aristotle East and West: Metaphysics and the Division of Christendom
by David Bradshaw
Cambridge University Press, 2004



Could decisions made by philosophers over a thousand years ago still affect us today? David Bradshaw, a professor of philosophy at UK, thinks that the answer is yes.

Bradshaw's field of research is ancient philosophy and its role in the formation of Christian thought. He believes that roughly between 300 and 500 A.D. a chasm opened between the eastern and western branches of Christendom. The western half, comprising what today is Western Europe, spoke and read Latin. The eastern half, comprising what today is Greece, Turkey, Syria, and Egypt, spoke and read Greek. Because of this language difference, the two sides largely stopped reading one another's theological literature or participating in one another's debates. Each developed along its own path.

Why should that matter today? "We're all the inheritors of western culture," says Bradshaw. "And western culture was shaped, for better or worse,

by western Christianity. That means that if western Christianity developed any imbalances or distortions, then they still affect us today." Much of the way Christianity shaped our culture, says Bradshaw, was due to what he calls "local features" of the western church.

"For example, western theologians like Augustine and Aquinas taught that the goal of human life is an intellectual vision of the divine essence. That stance led to an emphasis on the mind as the essential aspect of the human being, an emphasis you don't find in the East. Instead, for the East the goal was for the whole person to be deified, the body as well as the soul."

Bradshaw's book, *Aristotle East and West: Metaphysics and the Division of Christendom*, is a study of how the division occurred. "People ask me why I start as far back as Aristotle," Bradshaw remarks. "But you can't understand medieval Christian thought without Aristotle. In fact, my thesis is that the differences between the two branches of Christendom go back to the different ways they appropriated the metaphysics of Plato and Aristotle—that is, their basic thought about what's real."

The book focuses especially on a term coined by Aristotle, *energeia*. Although it is the source of our term "energy," its meaning in Greek philosophy was fluid. "*Energeia* came to mean energy during the first few centuries A.D.," Bradshaw explains. "This was important because it opened up a new way of thinking about the relationship between God and man. The easterners, both pagan philosophers who were also developing the thought of Plato and Aristotle, as well as Christian philosophers, thought of God as having an energy that can be shared with human beings. They thought of this as a way of knowing God that's different from intellectual knowledge. In the West, because of differences in language, this meaning of the word never developed. So in the West there was a more exclusive emphasis on knowing God through intellectual means."

Bradshaw's early interest in philosophy was overshadowed by his interest in science. An Alabama native, Bradshaw majored in physics at Auburn University, where he had a life-changing encounter. "I met an English professor who was a convert to the Eastern Orthodox Church. I joined both his church and his family," says Bradshaw, who converted and married the professor's daughter, Mary. After graduation, he studied philosophy of science for a year at Notre Dame, taught high school, and worked in private industry for several years before returning to graduate school at age 31.

Aristotle East and West won the 2005 Forkosch Prize from the *Journal of the History of Ideas*.

—Jeff Worley and Liz Hansen

Odyssey
Summer 2006

Parting Shots

"I have a simple philosophy. Fill what's empty. Empty what's full. And scratch where it itches."

—ALICE ROOSEVELT LONGWORTH

"This is my simple religion. There is no need for temples; no need for complicated philosophy. Our own brain, our own heart is our temple; the philosophy is kindness."

—DALAI LAMA

"There is only one thing a philosopher can be relied upon to do, and that is to contradict other philosophers."

—WILLIAM JAMES

"A great philosophy is not one that passes final judgments and establishes ultimate truth. It is one that causes uneasiness and starts commotion."

—CHARLES PEGUY

"Philosophy is a battle against the bewitchment of our intelligence by means of language."

—LUDWIG WITTGENSTEIN

"Philosophy consists very largely of one philosopher arguing that all others are jackasses. He usually proves it, and I should add that he also usually proves that he is one himself."

—H. L. MENCKEN

"The point of philosophy is to start with something so simple as not to seem worth stating, and to end with something so paradoxical that no one will believe it."

—BERTRAND RUSSELL

"What is the first business of one who practices philosophy? To get rid of self-conceit. For it is impossible for anyone to begin to learn that which he thinks he already knows."

—EPICTETUS

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Victoria Flanigan (left) was commissioned by Leslie Crofford, director of the Center for the Advancement of Women's Health, to create a painting for the new Women's Health Clinic. "She was exploring issues of body and acceptance. I think it's important that we be conscious of the relationship between women and their bodies," says Crofford. Flanigan, who created the cover of this magazine and artwork for "Reshaping Women's Health Research" (p. 2), earned her master's degree in fine arts at UK in May 2006.

Also in this issue:

Enlisting Blackberries in the Fight against Cancer, p. 18
Telling the Stories That Need to Be Told, p. 22

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