Family History Plays a Major Role in Disease Risks

By Dama Kimmon
dama.kimmon@uc.edu

Knowing your family’s history for certain diseases can make a big difference in your own health, says UC genetics expert Melanie Myers, PhD.

In fact, family history is a key risk factor for many diseases, including cancer, diabetes, heart disease and stroke.

But, says Myers, many people aren’t as informed as they should be about their health history. And, she adds, existing family history resources do not engage communities with low literacy levels.

Myers was awarded a $100,000 grant from the National Human Genome Research Institute of the National Institutes of Health to develop ways to educate low-literacy populations, including the Appalachian population in the

See DISEASES page 4

Man’s Best Friend Might Help Decrease the Development of Infant Allergies

Findings Refute Earlier Claims That Pets Alone Prevent Infant Wheezing

By Amanda Harper
amanda.harper@uc.edu

Living in a home with multiple dogs may help reduce an infant’s risk for developing allergies later in life, according to a new UC study.

Led by David Bernstein, MD, UC researchers have found that infants living in homes with high levels of endotoxins (contaminants) and multiple dogs were more than two times less likely to wheeze than other infants.

Researchers found that wheezing was not associated independently with either dog or cat ownership or high levels of indoor endotoxin; however, high endotoxin exposures in homes that also had multiple dogs resulted in less wheezing.

“Our research presents evidence that pet ownership offers a protective effect against development of lower respiratory symptoms in young children,” says Bernstein.

The findings conflict with earlier studies suggesting that exposure to either high endotoxin levels or pet ownership can reduce the risks of future allergic diseases, the UC team reports in the December 2006 edition of the Journal of Allergy and Clinical Immunology.

“Exposure to high endotoxin levels in the home may not be an important determinant of aerosol-laden sensitization during infancy,” explains Bernstein, professor of immunology at UC and senior author of the study. “We don’t yet understand how exposure to high levels of bacterial endotoxin and multiple dogs in the home protect these high-risk infants from wheezing early in life.”

Endotoxins are natural compounds secreted from pathogens, like bacteria, that are commonly found in the intestines and feces. Scientists believe that endotoxins can stimulate our immune systems in many different ways. “Our bodies are programmed to produce allergic responses early in

See DOGS page 3

Balloon Treatment Offers Hope for Chronic Sinus Sufferers

By Jamie Davis
jamie.davis@uc.edu

Nearly 40 million hay fever sufferers in the United States experience headache, facial pressure and a stuffy nose when pollen is in the air.

But for 37 million people with chronic sinusitis, relief from these symptoms doesn’t come with a change in the season.

Inflammation of the sinuses is often due to infection or anatomic abnormalities.

“The sinuses drain through small, bony channels,” says Allen Seiden, MD, professor of otolaryngology at UC. “When the sinuses are blocked and don’t drain, people can have trouble with recurrent infections associated with difficult breathing, headaches and fatigue.”

Traditionally, sinusitis is first treated with antibiotics and decongestants, as well as by addressing any underlying problems such as allergies. For patients who don’t respond adequately to medications, the next step may be endoscopic sinus surgery.

This involves inserting a thin, fiber-optic tube into the nose, which allows the surgeon to see the sinuses close-up, and then using specially designed instruments to remove small pieces of bone and tissue to open up the drainage passages.

Now a new treatment for the condition is giving sufferers another option that doesn’t involve cutting or removing tissue.

Called balloon sinuplasty, the See BALLOON page 3

Research Dollars Exceed $330 Million for Second Year

Research Office Makes Changes to Ensure Future Research Growth

By Dama Kimmon
dama.kimmon@uc.edu

The university’s research enterprise topped $330 million for the second year in a row, despite the leveling off of national research-funding budgets.

Fiscal year 2006 research data was presented to the UC Board of Trustees at their November meeting by Sandra Degen, PhD, vice president for research.

The Academic Health Center and its affiliates account for 82 percent ($272.3 million) of the university’s research budget. But it’s the National Institutes of Health—the major funding source of basic and clinical research, which provides more than half UC’s research dollars—that has experienced the greatest budgetary woes.

“We should be proud that we were able to hold our own in such a tense budgetary climate,” says Degen. “But we must begin to think about ways to continue to be successful as securing funding becomes even more difficult. That may mean setting more proposals or becoming more creative when searching for funding sources.”

Over the past year, the Office of Research has implemented a few new strategies to ensure future research success.

Once again in 2006, grant-writing workshops were offered—this time with the addition of an arts and humanities session as requested by 2005 attendees.

The Office of Research and the University Research Council made

See DOLLARS page 2

AN INFORMATION RESOURCE FOR ACADEMIC HEALTH CENTER FACULTY, STAFF, STUDENTS AND FRIENDS.
Genetics Experts Investigate Causes of Harmful Metabolic Disorder

By Amanda Harper

UC researchers have received more than $1.6 million from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) to study genetic causes of metabolic syndrome, a disorder that can lead to cardiovascular disease and diabetes.

“Metabolic syndrome has emerged as a public health problem of epidemic proportions in Western societies like the United States,” says Ranjan Deka, PhD, a UC environmental health professor who will lead the international study. “To combat this complex disease, we need to establish genetic biomarkers that can help us identify people at risk—people who may have a genetic predisposition to the disease.”

Deka believes that genetic disposition is a combination of inherited risk factors, and, according to the American Heart Association, about 25 percent of Americans have it. Untreated, it can lead to life-threatening health problems such as coronary artery disease, stroke and type 2 diabetes.

The study aims to identify and isolate the specific genes associated with metabolic syndrome so that scientists can identify at-risk populations.

“Metabolic syndrome is a complex disease that can’t be attributed to just one cause,” explains Deka. “Genes don’t act alone. They work in concert with environmental, lifestyle and family histories factors, along with diabetes and diabetes medication.”

Deka and his team will collect data from a genetically isolated population of about 80 large families living in the islands of Croatia.

Because these islands are a traditionally isolated society, Deka says, the people have a very homogeneous genome. This eliminates many of the confounding effects of a diverse population and is more conducive to research designed to isolate specific genetic causes of a disease.

Croatians also have many risks factors for metabolic syndrome, including obesity and high blood pressure—that cannot be explained by poor diet or lifestyle choices.

“Genetic causes of metabolic syndrome may be primarily linked to genetics, not lifestyle and environmental exposures.”

Deka and his team will collect blood samples, environmental data (such as diet and lifestyle), family medical history and other demographic information from about 1,200 individuals from the Croatian islands. They will perform DNA analysis on each person to identify genetic markers that may be linked to metabolic disease.

“By understanding what genetic mutations exist and where they are within the body’s genetic makeup, we can identify correlations between genetic abnormalities and specific diseases,” Deka says.

“When we can do that, we’ll have a better understanding of how to treat the underlying causes of common diseases.”

Study collaborators include UC’s Rajniit Chakrabsy, PhD, Pavas Radun, PhD, of the Institute for Anthropological Research in Croatia, and researchers from the University of Pittsburgh and Cincinnati Children’s Hospital Medical Center.
A new, implantable birth control method is being offered for the first time in the United States. The drug offers protection for nearly three years.

Implantable Birth Control Offers Women a New, Convenient Long-Term Option

By Jamie Davis
jamie.davis@uc.edu

A single-rod, implantable contraceptive that has been available in other countries since 1998 is now being used in the United States, including in the Cincinnati area. The implant is injected under the skin of the upper arm during an in-office procedure that takes about one minute. The implant, the size of a matchstick, releases a steady stream of the hormone estrogen (Implanon) over a three-year period.

“This is a great option for women who can’t take pills or don’t easily tolerate other birth control options like IUDs and the patch,” says UC fertility expert and contraceptive researcher Michael Thomas, MD. Etonogestrel works by thickening the cervical mucous, which prevents sperm from fertilizing an egg and also stops any egg that does get fertilized from implanting itself in the uterine wall. Etonogestrel completely inhibits the release of eggs from the ovaries during the first two years. In the third year, it begins to lose its effectiveness.

Women who use this form of birth control don’t have to worry about taking a pill every day or changing their birth control ring every month,” says Thomas. “It’s a great long-term option.”

Thomas cautions, however, that the implant may not be for everyone.

“Unfortunately, irregular bleeding is a side effect. Women have to be willing to tolerate this possibility. Also, women who experience heavy bleeding or are significantly overweight may want to consider other birth control options.”

Thomas is a physician with the UC Center for Reproductive Health at Christ Hospital, which has expertise in infertility, menopause and endocrinological disorders. Established in 1987, the center is the only comprehensive patient and research unit focused on women’s health in the Cincinnati area.

To contact the center, call (513) 585-2355. To learn about birth control studies at UC, call (513) 584-4100. Thomas has no financial interest in any of the medications he recommends.

Although the procedure cannot be used for ethmoid sinus disease alone, Seiden and Zimmer say, it can be used in a combination approach when other sinus issues need treatment.

“it’s fairly common for people to have trouble with only one of their sinuses,” explains Zimmer. “Traditional sinus surgery can be done on the ethmoid sinuses, and the balloon sinuplasty is an addition to the two results in wheezing. Both procedures offer the potential to improve quality of life and reduce the need for surgery. However, findings have been inconsistent,” according to Bernstein. Until now, it was unclear whether animal ownership, endoscopic exposure or a combination of the two results in wheezing. Bernstein says further research is needed to determine if these early protective effects have long-term benefits.

BALLOON: Physicians Offer a Better Way to Curb Sinusitis

procedure dilates sinus openings much like clogged arteries are opened during balloon angioplasty. The implant involves the insertion of a thin wire, which carries a balloon, through the nostrils and into the sinuses. The balloon is then inflated with enough pressure to dilate the sinus openings. “This procedure is less invasive than endoscopic sinus surgery because there’s no cutting, which should also result in less scarring,” says Lee Zimmer, MD, assistant professor of otolaryngology at UC.

Seiden and Zimmer say the procedure offers a quicker recovery time than traditional sinus surgery because it results in less pain and bleeding. However, it may not be appropriate for all sufferers.

The human skull has a number of different sinuses, including six to 12 small “ethmoid” sinuses on either side of the face between the eyes.

“Unfortunately,” says Seiden, “balloon sinuplasty can’t be used in people with diseases ethmoid sinus, which tends to be an area that’s a problem for many sufferers.”

Seiden and Zimmer have no financial interest in the manufacturer of balloon sinuplasty, balloon sinuplasty, call (513) 475-8800.
Cincinnati scientists have found further evidence that certain defensive white cells in the body cause a major role in asthma symptoms. Their findings could lead to identifying a new treatment “target” to help the estimated 17 million asthma sufferers in the United States.


Working with genetically altered mice, the team studied a group of cells called eosinophils. Originally evolved to defend the body against parasite infection, eosinophils are known to accumulate during allergic responses—and especially in mucous in the lungs of asthma patients.

“Researchers have been looking at the role of eosinophils in asthma for years,” says research associate and first author Patricia Fulkerson, PhD. “Since people in the Northeast world don’t have parasi- tes in their guts to the extent they used to, the question is what do eosinophils do for us?”

“Previous studies linking eosinophils to asthma were done in single models,” Fulkerson explains. “We increased the power of our study by looking at multiple mod- els, and by doing that we show a strong role for eosinophils in mucous production in asthma.”

The researchers, led by Professor Marc Rothenberg, MD, PhD, of the College of Medicine and Cincinnati Children’s, also showed that eosinophils contribute to the development of the immunity-regu- lating proteins known as cytokines, a process that allows mucous to accumulate in the lung.

“Previously, most scientists looked at one model at a time— eliminating as many eosinophils as possible, inducing each model with asthma, and then watching what happens in an allergic response,” Fulkerson says. “Using one model, however, it’s difficult to determine the role of eosinophils versus that model’s own genetic strategy.”

The researchers instead used three different models. They stud- ied one mouse model in which eosinophils don’t develop from bone marrow, as they should, and two models in which eosinophils remain in the blood stream instead of re- sulting into the lung tissue to protect against asthma.

They then looked at the charac- teristics that all three models had in common so that the models could attribute any alteration in their appearance to eosinophils, and not to that par- ticular model’s genetics.

In the absence of eosinophils, the researchers report, they found that allergen-induced mucous pro- duction dropped in all models, sug- gesting that “eosinophils play a big role in mucous production in response to an allergen challenge.”

The researchers also report that eosinophils alter the lungs’ “micro environment” by stimulat- ing protein production in the signaling cytokines. Involved in triggering the body’s immune defense mech- anism to take action against infec- tion, cytokines are responsible for almost all asthma characteristics.

“If cytokines are produced in the lungs, people can develop asthma, says Fulkerson. “But we found in eosinophil-free models that the cytokines that together produce almost all the visible symptoms of asthma—known as IL (interleukin) 4 and IL 13—were markedly reduced.”

Having shown that eosinophils play an important part in mucous production and airway obstruction in asthma, the researchers’ next goal was to determine how they actually do that.

Examination of mouse lung tis- sue revealed increased genetic activity associated with the charac- teristics of asthma: mucous, airway obstruction and hyperactivity.

“We took two of these models and looked at changes in gene expression that were caused by eosinophils,” says Fulkerson. “We only picked up the genes that were in common in both models, so we can say the changes were eosinophil dependent versus model dependent.”

“Now we have this list of genes that are eosinophil depen- dent in an experimental animal model and we’re identifying new pathways that have never been attributed to eosinophils before,” Fulkerson adds. “Now we and other researchers will pursue this to learn exactly what eosinophils are doing to those pathways and to see how we can block their contribu- tions to asthma.”

Some of these genetic pathways were known to be important in asthma, says Fulkerson, but no one had previously attributed them to eosinophils.

“If we can prevent eosinophils from being activated, then perhaps we can develop new targets for treatment,” she says. “The goal is to find new approaches to asthma, because although we can treat asth- ma symptoms fairly well, we’re not so good at dealing with the long- term consequences.”

“The emphasis is not just to treat asthma. There are a lot of other diseases, especially digestive dis- eases, in which we see high levels of eosinophils that don’t belong there,” Fulkerson says.

Study collaborators included Christine Fischetti, Melissa McBride, Lynn Hassman and Simon Hogan, all of Cincinnati Children’s.

DISEASES: Importance of Knowing Family History

from page 1

Greater Cincinnati and Dayton metropolitan areas, about the importance of family history.

“The idea is that we can use the information that will connect groups to focus on determining current mindsets about the importance of family history. The team is made up of experts from the UC College of Allied Health Sciences and environmen- tal health department, the human genetics division at Cincinnati Children’s Hospital Medical Center, the area health literacy program at Ohio State University, the Appalachian outreach studies program at Sinclair College in Dayton and six other community organizations.”

The team will research what tools already exist to educate low- literacy populations about their health and health history, and will then develop additional resources to improve education about this important asset.

“Because family health history is so important to everyone, we hope the resources we develop will also serve as a model for education and awareness in other communities with low-literacy characteristics,” says Venkat, director of the genetic counseling program in UC’s College of Allied Health Sciences.

But it’s not just the general pub- lic who should be concerned about health history, she adds. “We also want to make sure health professionals working in these areas collect important health history information,” she says. “And once they have collected it, we want to make sure it’s being put to use to improve health and prevent disease.”

In 2004, the U.S. Surgeon General’s office began its Family Health History Initiative to pro- mote improved knowledge about health history. Their Web-based “My Family Health Portrait” (www.familyhealthhistory.hhs.gov) will serve as a tool during education sessions throughout the UC health history project.

Local community organizations involved with the UC family health history project include the Urban Appalachian Council and the Lower Price Hill Community Health Center, both in Cincinnati; Community Center of Volun- teers of America, the Dayton Southwest Weed Seed Initiative and Life Enrichment Center, all in Dayton, and Brighton Center Inc., in Northern Kentucky.

For more information about the UC family health history pro- ject, or to become involved, call Myers at (313) 636-8488 or e-mail melanie.myers@uc.edu.