Researchers investigate asthma causes

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Research News

Georgia Tech Research Institute (GTRI) researchers have developed a sensor system that continuously monitors the air around persons prone to asthma attacks. Worn in the pockets of a vest, the new system could help researchers understand the causes of asthma attacks.

"We are investigating whether we can go back after an asthma attack and see what was going on environmentally when the attack started," said Charlene Bayer, a GTRI principal research scientist.

This research was supported by the U.S. Department of Housing and Urban Development, with initial funding from the GTRI Independent Research and Development (IRAD) program.

Although it is not known why certain people get asthma, doctors know that once a person has it, the lungs can overreact to environmental stimuli causing chest tightness or breathlessness, known as an asthma attack.

The new sensor system measures airborne exposure to formaldehyde, carbon dioxide, nitrogen dioxide, temperature, relative humidity and total volatile organic compounds (VOCs). VOCs are emitted as gases.

GT SMART continued, page 3
Scientists enlisting gold in cancer fight

"There are a lot of different solutions on the table, and you need a big combination of many different things. It’s not just about reducing carbon dioxide emissions, it’s also about reducing carbon in many different things. It’s not just about cutting emissions because the solutions presented did not present climate change as a complex problem. (ABC News)

Abuelitos Program, where students 'adopt' a senior citizen and give them rides to the Latin American Association (LAA) in Atlanta, tutoring students at Woodward Elementary School and helping in the bilingual customer service department at Children’s Healthcare of Atlanta. Nearly 90 percent of Woodward’s students are Latino, Comfort says. "Of the parents, only about 10 percent speak English well.

Ms. Comfort also has developed an after-school mentoring program at Buckhead Creek Apartments. Students also work on their own accord. "These kids are in families where both parents work, not getting home until about 7 or 8," Comfort said. "They are really unsupervised. Our students help them with homework and sports."

With this foundation already laid, Comfort offered Spanish 4813-A: Service-Learning in the Hispanic Community as a Special Topics course in the fall. Students worked both in a classroom and volunteer capacity. For class, they created a documentary—either in pictures, with video, or as a short story or blog—and wrote a cultural investigation research paper that applies one of the class themes to their volunteer site and experience. According to Comfort, this is the first service-learning oriented class offered in Modern Languages.

While she initially wanted to offer Spanish 4813-A each semester, Comfort found that the time involved—two course credit hours and one "lab" credit hour (three hours) per week—the students from attending at the times of offered. Upon approval from the Undergraduate Curriculum Committee, Comfort will offer the class once a school year.

"I didn’t want our good students to want to be short-listed," she said. With 25 to 30 active members, the organization’s presence in the community continues to grow. The student group, Comfort said, instituted longevity to the class. "All of our programs are ongoing."

In addition to helping the community without, she sees her efforts as also helping the Latino community within the school site. "Hispanic speakers may want to volunteer," Comfort said. "There is some incentive for Hispanic students to come to Tech when they see organizations like this."

Less than 10 percent in the club are Latino—we’re hoping for more." Carisa Hettich, volunteer coordinator for LAA, said Comfort met with few students involved. I wish I had a contact like her in every school.

Some future GLASSS initiatives include linking with The Girl Scouts and Big Brothers/BIG Sisters, Comfort said. Caminar Latino, a domestic-violence intervention program, has approached her for volunteers. "I’d like to see the club grow in number, and for more Latinos to become members," she said. "I’d like to see the class offered year-round. I want to see Tech’s name solidified in the Latino community."

She has applied for a PIPSE grant (Fund for the improvement of Post-secondary Education) to help incorporate more community services in several classes. "We have a unique model for offering some classes with a service aspect," she said. In addition to teaching Spanish 4813 yearly, she also is working to establish a Spanish internship class, which would be open to seniors and juniors pursuing a dual-degree in Spanish major in International Affairs and Modern Languages and Economic and Modern Languages. Now in her third year at Tech, Comfort previously worked as a student volunteer for Americorps. "As an undergraduate, I was interested in using my Spanish-speaking skills in an educational aspect," Comfort said. She taught English to Speakers of Other Languages (ESOL) and literacy courses, serving more than 100 students. "This is where my fluency in the language really took off. I wanted my students to have this same experience. Students here are very hard-working and enthusiastic."
from products such as paints, cleaning supplies, pesticide formulations, building materials and ammunition, officials say.

In addition, a special mesh filter collects particles to be analyzed in the lab. The battery-powered system fits into the pocket of a vest and contains commercially available sensors that were integrated into a single system by Mark Jones, chief executive officer of Keehi Technologies.

“The device weighs less than one pound including batteries and it takes a measurement of air every two minutes, stores the data in on-board memory and then sleeps to conserve battery power,” said Jones.

Bayer and GTI Research Scientist Robert Hendry calibrated and tested the sensors in a large room-sized chamber that simulates environmental conditions inside buildings. Coupled with sensitive mass spectrometers, the chamber allows the changing indoor air chemistry to be studied in detail.

The sensor system is designed to be comfortably worn in the pockets of a vest throughout the day and kept at the bedside while sleeping at night. Another vest pocket contains an electronic peak flow meter to periodically measure pulmonary function. When experiencing an asthma attack, the vest wearer notes what time it occurred so Bayer can examine the corresponding levels of the chemical compounds.

Six adult volunteers have tested the vest for comfort and the effectiveness of the sensor system under actual use conditions. One volunteer's vest led researchers to discover a pollutant pathway from the volunteer's basement garage into the living areas that was allowing automobile exhaust and gasoline fumes to invade the house.

With further funding, Bayer hopes to develop a smaller and more sensitive sensor system, test the real current vest in population studies of asthma children and develop software to process the population studies data as it is collected.

“With this system we can determine what children are exposed to at home, at school and outside where they play,” said Bayer.

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IN BRIEF:

Road closing reminder

Beginning Sunday, Feb. 9, the 14th Street exit ramp and Techwood Drive from 16th to 10th streets will close as part of the 14th Street Bridge improvement project.

The road is projected to remain closed until summer 2009. Traffic traveling southbound on the connector will be detoured to 17th Street in order to access 14th and 10th streets. The Georgia Department of Transportation encourages drivers to use the Northside Drive exit.

For more and updated information, visit www.14thStreetBridge.com.

Day camp registration

The Campus Recreation Center is offering Tech Wreck Day Camp this summer, for children of faculty, staff, students and CRC members. Four two-week sessions will be offered, from June through July. Those eligible to attend are children entering grades 1 through 7.

Registration for faculty, staff and students will be through Feb. 15. Registration for CRC members will be from Feb. 11-29. For more information, visit www.crc.gatech.edu.

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**GT SMART**, cont'd from page 1

regarding alcohol products."

Of the 10 campuses chosen, Tech is the only urban-area community. “As such, we had very different challenges,” Brinkley said. And as one of the last campuses to join the program (in 1999), Tech is one of the last still using the APD model. The APD plan was originally five years in length, but a four-year extension was granted in 2004. Funding supports the current program until Aug. 31.

“For the first three years, everything was focused on campus activities,” Brinkley said. “To meet the grant’s requirements of engaging the community, GT SMART in 2002 conducted a quality-of-life survey on 600 Atlanta residents. The purpose was to determine what type of interventions would best address the community’s concerns. Another aspect of the intervention development process included the formation of committees and task forces, which included civic and business leaders, as well as Tech faculty, staff and students. These committees worked with elected officials to review and rewrite some of the local ordinances. And as community members learned of some business owners’ practices, changes to and enforcement of laws governing alcohol sales were welcomed.”

Other established outreach programs include free online alcohol server training and an anonymous tip line for people to report businesses suspected of operating outside the law, either by selling to minors or by otherwise violating existing laws.

While 911 is not always perceived as being anonymous, our tip line is,” she says. “The beep, beep, callers are instructed to give the name of the business, what illegal activity is suspected and the business location. Callers are reminded that they need not give their names. Information is then sent to the police, and is investigated at the discretion of the police department.” In the tip line’s first year, Atlanta Police issued a record number of non-compliance tickets. Brinkley credits Atlanta Police Chief Richard Pennington with putting more officers into the alcohol compliance unit. As businesses learn the situation, the number of citations has since tapered off.

The online program—Responsible Alcohol Sales & Server Training (RASS)—was developed for alcohol licensees and their employees. Brinkley says the module is the first online, interactive program in the state. Successful completion of RASS, which takes roughly two hours overall, includes two tests. “If you don’t pass, you can take the exam again—but the questions change,” Brinkley said.

Through data gathered in user surveys, Brinkley says the program has proven to be a valuable tool for learning state laws and empowering people to do their jobs well.” When sufficiently completed, the course provides a certificate, which, in turn, makes employees more marketable.

In fall 2007, Athens-Clarke County mandated alcohol server training, and the chief of police approved the RASS program. Brinkley says RASS is now in 18 counties and 223 establishments, and more than 2,500 people in the alcohol-service industry have completed the program.

Fall semester also kicked off the parent outreach initiative with the start of GT SMART’s lecture series. In the first, the speaker made a presentation on pharmacology and drinking, as parents—and students—may not be aware of medicinal interaction with alcohol.

On Jan. 31, Tiaa Standing Tall Executive Director Nicole Holt presents “Alcohol Marketing and Youth” showing how ads and TV spots are aimed at young people. “We, as adults, miss these messages,” Brinkley said. GT SMART is working on getting the rights to podcast this presentation to reach more parents. “Our students come from so many states, not to mention countries.” In February, there will be a presentation of a program made possible by The Sam Spady Foundation, which tells the story of Spady, a 19-year-old college student who died of alcohol poisoning. (Because of issues this presentation will not be pod cast.) All the free online programs are open to the public.

The full parental outreach initiative, including an online component, is still under development. Tech is partnering with the University of Minnesota to survey incoming students’ parents on their beliefs about students’ attitudes toward alcohol. In 2006, Tech began using AlcoholEd to collect data from incoming freshmen about their attitudes toward alcohol, which will be paired with the parents’ information. Brinkley says that parents’ experiences with alcohol in college is very different from today. “These kids thought they did it, and they turned out all right,” she said. “But it’s a much more dangerous world than when they were in college,” she said, referring to date rape drugs and other hazards confronting college students today.

One overarching challenge of GT SMART has been in overcoming its perception.

“We push responsibility (for those of legal age), not temperance,” Brinkley said. “We do stress not drinking until it’s legal. We’re not here for a ‘dry’ campus or taking away fun. We are here to promote safety and responsibility.

“Nobody seems to teach young people how to safely drink when they’re old enough,” she said. The outreach and other presentations are designed to teach parents how to approach the subject with their kids. “Every year, we have several students who need medical attention (because of drinking),” she said. “The past few years, we have received more calls for help, so we feel our message is getting out.”

While these new initiatives are important, there’s only one priority for Brinkley as the program winds down. “Right now we’re working to institutionalize programs that have been successful,” Brinkley said, specifically mentioning the RASS, tip-line and student programs. “We’re finding ‘homes’ for them, either at Tech or off-campus.”

Some are garnering international attention from other educational institutions from around the globe. Last August, Brinkley presented “Effective Strategies to Reduce High-Risk Drinking Among College Students and Residents in an Urban Environment” at a round table conference at the University of Oxford. This opportunity, she said, came out of an outreach with the president of the University of Dublin. “We’re seeing that what we’ve produced can be initiated in other countries,” she said. Her case study will be published by the Oxford University Press.

Prior to Brinkley’s arrival at Tech in 2002, she worked for Atlanta Mayor Bill Campbell’s office, where—among her other duties—she was named the city’s liaison to the program after its inception. GT SMART is part of the Office of the Dean of Students.

“I think the main lessons learned from developing the model were—and still are—the components of information and education, the two keys are legislation and enforcement,” Brinkley said. You don’t have both, things won’t change.”

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[For more information...]

Georgia Tech Research Institute

www.gtri.gatech.edu
**CAMPUS EVENTS**

**Arts & Culture**

**Jan. 29**

“The Day the Earth Stood Still” (1951) will be shown from 7 to 9 p.m. in the Library East Commons Room. The screening is part of the School of Literature, Communication and Culture’s 2008 Science Fiction Film Series. For more information, visit www.lcc.gatech.edu.

**Jan. 31**

The College of Architecture along with the Georgia Tech Library kicks off the COE Research Forum from 11 a.m. to noon in the Architecture Library. Gill Weinberg, director of the Music Technology Program, presents “New Avenues of Musical Expression.” For more information, visit www.coa.gatech.edu.

**Feb. 1**

Musician and composer Peter Schickele—along with his alter ego P.D.Q. Bach—will perform at the Frist Center for the Arts at 8 p.m. Tickets range from $26 to $36. For more information, visit www.ferstcenter.gatech.edu.

**Feb. 2**

The African Children’s Choir will perform at the Frist Center for the Arts at 8 p.m. Single-show tickets range from $15 to $25. For more information, visit www.ferstcenter.gatech.edu.

**Feb. 7**

Associate Director of Poetry@Tech Travis Denton introduces the McEVer Poets, Laure-Anne Bosseelaar, Bruce McEver and Opal Moore, from 4:30 to 6 p.m. in the Clary Theatre, and the Student Success Center. For more information, visit www.poetry.gatech.edu.

**Feb. 16**

Chemical and Biomolecular Engineering Associate Professor Pete Ludovice hosts “Pocket Protectors and Other Fashion Statements,” at 8:30 p.m. in room G011 of the Molecular Science Building. For more information, visit www.chemistry.gatech.edu.

**Faculty/Staff Development**

**Ongoing**

The Office of Organizational Development offers a Web-based tutorial on the basics of using a state purchasing card (p-card). To register, visit www.trainsweb.gatech.edu.

**Jan. 30**

The Georgia Tech Counseling Center and the Women’s Resource Center present the “Resolutions 2008” Lunch and Learn, noon at the WRC. To register, visit www.womenscenter.gatech.edu.

**Miscellaneous**

**Jan. 30**

**The Center for the Enhancement of Teaching and Learning is accepting nominations for three awards:** The CETL/BF Junior Faculty Teaching Excellence Award; the CETL/BF Outstanding TA Award, and the Education Partnership Award. Nominations are due Feb. 4. For more information, visit www.cetl.gatech.edu.