Pitt Researchers Prevent Type 1 Diabetes in Mice

By Jim Swyers

Pitt investigators have successfully prevented the onset of Type 1 diabetes in mice prone to developing the disease using an antibody against a receptor on the surface of immune T-cells.

According to the investigators, these findings, published in the January issue of the journal Diabetes, have significant implications for the prevention of Type 1 diabetes.

More than 700,000 Americans have Type 1 diabetes, an autoimmune disorder in which the body errantly attacks the insulin-producing cells of the pancreas, causing chronically elevated levels of sugar in the blood, leading to blindness, kidney failure, heart disease, and nerve damage. Previously known as juvenile diabetes, Type 1 diabetes is usually diagnosed at a very early age, but in some cases it can be diagnosed in adulthood.

In this study, the Pitt researchers treated non-obese diabetic (NOD) mice with an antibody—a type of protein produced by the immune system that recognizes and helps fight infections and other foreign substances in the body—directed against a receptor known as CD137 on the surface of a type of immune cells called T-cells. Treating NOD mice with the anti-CD137 antibodies significantly suppressed the development of diabetes, whereas most of the control mice developed diabetes by the time they were six months old.

Interestingly, the antibody therapy did not appear to cure the NOD mice, because the researchers were still able to see lymphocytes in their pancreatic islets, a telltale sign of pancreatic inflammation and autoimmunity.

In addition, when the researchers isolated cells from the spleens of the antibody-treated mice and injected these cells into immune-deficient NOD mice, seven of the nine recipient mice developed Type 1 diabetes, indicating that the donor mice still harbored pathogenic T-cells. On the other hand, when the researchers transferred a certain subset of T-cells from anti-CD137-treated mice that expressed two other receptors known as CD4 and CD25 to other immune-deficient NOD mice, it prevented the onset of diabetes in the recipient mice.

According to William M. Ridgway, assistant professor in the Pitt medical school’s Department of Rheumatology and Clinical Immunology, this therapy may prevent the onset of Type 1 diabetes in genetically at-risk people.

According to senior author William M. Ridgway, assistant professor in the Pitt School of Medicine’s Department of Rheumatology and Clinical Immunology, this therapy, if given early enough, may prevent the onset of Type 1 diabetes in genetically at-risk people.

“Our studies and others suggest that CD137 plays a significant role in the development of and genetic predisposition to Type 1 diabetes,” Ridgway said. “In this study, for the first time, we have demonstrated that CD137 therapy can suppress the development of Type 1 diabetes in mice and that the effect is dependent on the induction of a certain subset of regulatory T-cells. If we can demonstrate this same genetic predisposition and therapeutic effect in human Type 1 diabetes patients, then this may prove to be a significant step toward preventing this disease before it can take hold.”

This research was funded by the National Institutes of Health through the Autoimmunity Centers of Excellence.

Pitt Mathematician Nets Award for Cracking a 400-year-old Problem

Thomas C. Hales winner of the American Mathematics Society’s inaugural David P. Robbins Award

In another nod to his success at unraveling a 400-year-old math mystery, Pitt Andrew W. Mellon Professor of Mathematics in the School of Arts and Sciences Thomas C. Hales took home an award for his unique math research from the American Mathematics Society (AMS) during the society’s Joint Mathematics Meetings in New Orleans Jan. 6.

The society’s David P. Robbins Award recognizes Hales’ work on the Kepler conjecture, a posit that spheres can most efficiently be packed in a pyramid shape. Johannes Kepler, a German astronomer and mathematician, could not prove his idea when he published it in 1611. Several people attempted to prove Kepler correct over the centuries, but they never completed the task.

Hales shook the mathematics world when he offered the long-elusive proof in 1998. On March 18, 2005, after an exhaustive computer search, the mathematics community was notified the conjecture had been proved.

Hales’ unique approach, a proof by computer, receivedmixed reviews but won him the $10,000 Robbins Award from the society.

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Medical School Discussion
Tonight to Shed Light on
Universal Health Coverage

By Kelli McElhinny

As escalating costs force more Americans to go without health insurance, the need to address this issue becomes increasingly urgent.

To shed light on the many aspects of universal health coverage, Pitt’s School of Medicine will host a panel discussion featuring representatives from the local medical, academic, and business communities.

The free public discussion, “Approaches to Achieving Universal Health Coverage in America,” is scheduled for 6:30 p.m. Jan. 16 in Seabiscuit Hall’s Auditorium 6. No preregistration is necessary.

Universal coverage often dominates discussions about health policy, with proponents arguing that such a system is necessary to ensure that all Americans get health care, and critics cautioning that universal coverage would result in inefficient governmental controls that would keep patients from getting even basic recommended treatments. Heated rhetoric often overshadows more objective information about universal health coverage that could help members of the healthcare community and the public reach their own conclusions.

The Pitt medical school event presents an opportunity for the public to learn more about a topic that is expected to take center stage in coming months, when legislators at the state and national levels debate health-care reform. The program is as follows:

“Universal Health Care Without a Single Payer: Oxymoron or Best Hope?”
David Blinder, Pitt clinical associate professor of family medicine and chair of UPMC Shadyside Hospital’s Department of Family and Community Medicine;

“Single Payer: Guaranteeing the Fundamental Right to Health Care in America,” Barry Tepperman, attending radiation oncologist, Allegheny General Hospital;

“Universal Health Care: How Shall We Share the Costs?” Judith R. Lave, professor and chair, Health Policy and Management, Pitt’s Graduate School of Public Health (GSHP); and

“Universal Health Care: Legislative Solutions.” Scott Tyson, CEO, Pediatrics South, and a member of the Children’s Hospital of Pittsburgh’s Medical Executive Committee.

Additional commentators will include Terence Starz, president of the Allegheny County Medical Society and a Pitt clinical professor of medicine, who will present the perspective of organized medicine; Julie Donohue, assistant professor of health policy and management in GSHP, who will provide information on health policy aspects of universal coverage; and Pitt medical student Gabriel Silverman, who will comment from the student viewpoint. Rohan Gangule, Pitt professor of psychiatry, pathology, and health and community systems in the Pitt medical school, will moderate the discussion.

Healthcare professionals in attendance will be eligible to earn continuing education credits.

For additional information on this event, visit www.publichealth.pitt.edu/universalhealth.

Because of a Pitt men’s basketball game at the Petersen Events Center this evening, participants are encouraged to arrive early to avoid traffic and parking congestion.

Christine A. Chergi, manager of the University’s William Pitt Union, won the 2006 Association of College Unions International (ACUI) Region 4 Service Award for outstanding service and leadership.

The award was presented at the ACUI Region 4 Conference, held at Morgan State University in November.

“Chris has provided ACUI Region 4 with continuous outstanding leadership and enthusiasm for our work with college students,” said Kyle Carter, campus coordinator at the University of Maryland’s student union and an ACUI representative.

Chergi, who has worked at Pitt for 34 years, helped to lead the conversion of what was originally the Schenley Hotel to a full-service student union. Union tenants include arts organizations; sports teams; ethnic and cultural alliances; fraternity and sorority offices; Pitt student radio, television, yearbook, and newspaper offices; and the Division of Student Affairs.

A Churchill, Pa., native, Chergi oversees a staff of six full-time employees, two graduate assistants, and more than 25 student assistants.
Postpartum Depression a Major Public Health Problem That Requires More Resources, Pitt Researchers Write

By Jocelyn Uhl Duffy

Childbearing is a potent event in the lives of women, a particularly vulnerable time for developing or exacerbating psychiatric illness, Pitt School of Medicine researchers wrote in an editorial published in the *Journal of the American Medical Association (JAMA)* Dec. 6.

The editorial, in response to a large Danish study of perinatal psychiatric episodes, calls for greater attention to the mental health of mothers and education, screening, and treatment programs.

After giving birth, one in seven mothers will experience some form of depression that impairs their ability to function, studies have shown. Many of them will be undiagnosed and untreated. This creates a major public health problem, say experts from Pitt and the University of California, San Diego.

"Postpartum depression not only affects the mother. It touches the father, other children in the family, and, most importantly, the newborn," said Katherine L. Wisner, professor of psychiatry and obstetrics, gynecology, and reproductive sciences in Pitt’s medical school and an associate investigator at the Magee-Womens Research Institute.

"Knowing what we do about the risks of postpartum depression, we must recognize our responsibility to address this illness through improved research and greater access to care and services," said Wisner.

The Danish study, which was published in the same issue of *JAMA*, was the first large-scale epidemiological examination of psychiatric illness during childbearing to be completed in more than 20 years. Researchers found that women were at much higher risk of hospitalization for psychiatric conditions during the three months after birth than were women who were 12 months postpartum. The risks were greatest for those giving birth to their first children.

According to Wisner, other research has shown that postpartum depression disrupts the relationship between mother and infant, which can do short- and long-term harm. Maternal depression can negatively impact a newborn’s mental and motor development and is associated with poor self-regulation, low self-esteem, and behavior problems. Postpartum depression also has a dramatic impact on the mother’s ability to function, enjoy relationships, cope with stress, and appreciate the joys of parenthood.

Wisner noted that the United States has not, until recently, prioritized postpartum illness as a major public health concern. In fact, the Agency for Healthcare Research and Quality has reported that while much is known about the risks and vulnerabilities of the postpartum period, substantial high-quality research is significantly lacking in this area.

Based on the recent study and past findings, Wisner recommended in the *JAMA* editorial that the United States implement a universal screening program, in which all women would be screened between two and 12 weeks postpartum. Those showing symptoms of psychiatric disorders should be treated immediately after diagnosis, she argued.

New Jersey was the first state to address the problem on the governmental level by legislating that all women receive screening and education for postpartum depression; the law went into effect in October 2006.

Pitt is conducting the first large-scale National Institute of Mental Health-funded trial of screening, treatment preference, and depression-care-management methods.

Researchers hope that information gained through this study will be used to develop universal best practices for screening and treatment.

For more information about the Pitt study or postpartum depression care at Women’s Behavioral HealthCare of Western Pennsylvania, call 800-436-2461 or 412-586-9072, or visit www.womensbehavioralhealth.org.

Women outside of the Pittsburgh area seeking more information or treatment should contact Postpartum Support International, www.postpartum.net, 1-800-544-4PPD.

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Pitt Mathematician Nets Award for Cracking a 400-year-old Problem

1998. In 2005, the academic journal *Annals of Mathematics* published a short version of Hales’ work titled “A Proof of the Kepler Conjecture” (the full version ran in the July 2006 edition of the journal *Discrete and Computational Geometry*). Reviewers spent five years vetting Hales’ proof. The long process spurred Hales to undertake what he calls the Flyspeck Project to develop computer technology that would automatically check the correctness of long, complicated proofs. The goal is to get away from the “pencil and paper” method of proof checking. Hales said Flyspeck could take up to 20 years to complete.

The AMS award honors Hales’ 2005 article. He shares the award with Samuel P. Ferguson of the National Security Agency, who coauthored part of the paper. Hales and Ferguson are the first recipients of the award, which was established in 2005 to recognize fresh research in algebra and discrete math.

The $5,000 prize is awarded every three years. In recognizing Hales and Ferguson, the AMS called their work “a landmark achievement.”

Established more than 200 years ago, the AMS has approximately 30,000 members and promotes mathematics by highlighting its relevance to other fields.
January 16
Luncheon Discussion, “Goedel, Glass Art, 2 p.m., 817R Cathedral of Learning, Pitt’s Center for Philosophy of Science, 412-624-1052, www.pitt.edu/~pittcmt.

Lecture, “Playing Hide and Seek With the Higgs,” Patrick Fox, researcher at the Lawrence Berkeley National Laboratory, 4:30 p.m., 103 Allen Hall, Pitt-Carnegie Mellon University Physics Colloquium Series, www.phys.pitt.edu/events.


Gardening the Natural World Through Family Talk in the Natural History Museum,” Amanda Godley, Pitt assistant professor of English education, Sasha Palmquist, graduate student researcher, Pitt Learning Research and Development Center; noon, 2205 Povar Hall, Pitt Women’s Studies Center, 412-624-0685, www.pitt.edu/wstudies.


Panel Discussion, “Approaches to Achieving Universal Health Coverage in America,” 6:30 p.m., Scalf Hall’s Auditorium, Pitt School of Medicine, 412-647-3557, nosl@pmsc.edu.


Musical Performance, Chris Botti, 7:30 p.m., 205 David Lawrence Hall, Pitt’s Department of Germanic Languages and Literatures, 412-648-2654, muller@pitt.edu.


Comedy Performance, “Best of the ’Burgh,” 7:30 p.m., Funny Bone Comedy Club, Station Square Drive South Side 412-281-5310, www.funnybonepgh.com.

January 18


Lecture, “Professors and Mad Pads: The Discovery of Notorious Nosmats and Rare Remedies,” John S. Luxi, director of Pitt’s Drug Discovery Institute, 6 p.m., Scalf Hall’s Lecture Room 5, Pitt’s Center for Bioethics and Health Law, 412-647-5700, www.pitt.edu/bioethic.


Musical Performance, jazz trumpeter Chris Botti, 7:30 p.m., Heinz Hall, 600 Penn Ave., downtown, Pittsburgh Symphony, 412-392-4819, pitsoh.org.


Musical Performance, The Phantom of the ’Burgh, 7:30 p.m., BistroBoh, 4104 Penn Ave., Lawrenceville, 412-621-4900.

Musical Performance, After The Fall, 10:30 p.m., Hard Rock Cafe, Station Square, 230 W. Station Square Drive South Side, 412-481-7625, www.hardrock.com.