

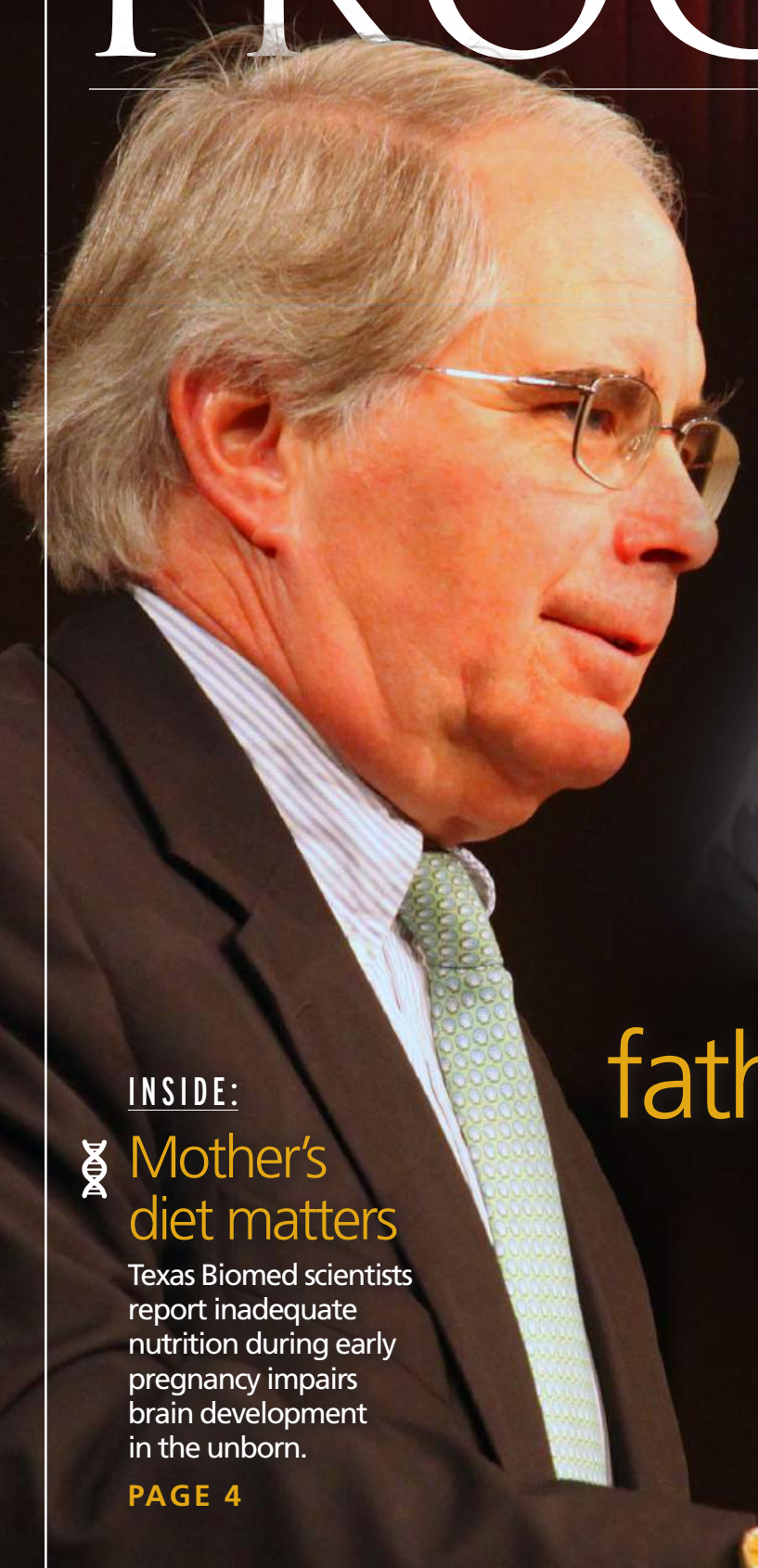


TEXAS BIOMEDICAL
RESEARCH INSTITUTE

SUMMER 2011

PROGRESS

Enhancing lives through discovery™



Honoring a father's vision and a new name

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INSIDE:



Mother's diet matters

Texas Biomed scientists
report inadequate
nutrition during early
pregnancy impairs
brain development
in the unborn.

PAGE 4

LETTER FROM THE PRESIDENT

DEAR FRIENDS,

I AM VERY PLEASED TO SHARE WITH YOU THE NEW FORMAT FOR OUR PROGRESS NEWSLETTER, WHICH GOES HAND-IN-HAND WITH OUR NEW NAME AND OTHER INITIATIVES TO SPREAD THE WORD ABOUT THE CRITICALLY IMPORTANT ROLE THE TEXAS BIOMEDICAL RESEARCH INSTITUTE IS PLAYING IN IMPROVING THE HEALTH OF OUR GLOBAL COMMUNITY. AN AMBITIOUS MISSION, BUT ONE WE HAVE BEEN PURSUING CREATIVELY AND PRODUCTIVELY FOR SEVENTY YEARS.

This is an exciting time for Texas Biomed as we are recruiting additional faculty, designing 70,000 square feet of new laboratory and support space and embarking on a new area of research, regenerative medicine, which offers the hope of tissue repair and replacement in the spinal cord, heart, pancreas, and other areas of the body. Of special note in San Antonio, which has a major presence in military medicine as well as diabetes, wound healing will eventually be accelerated through regenerative medicine approaches. And I am very proud to say that these efforts will involve researchers from the University of Texas at San Antonio, the University of Texas Health Science Center at San Antonio, the Southwest Research Institute, and other organizations in what can only be described as a unique inter-institutional environment where cooperation for the greater good is fostered.

Tom Slick understood that medical research has no boundaries and that what is discovered in San Antonio can have huge

significance in all corners of the globe. Similarly, the maladies that affect the residents of all the continents can impact us here at home. The global neighborhood is a reality, and Texas Biomed scientists are world renowned in their efforts to conquer malaria, tuberculosis, AIDS, mental illness, diabetes, heart and circulatory illness and a host of other health challenges.

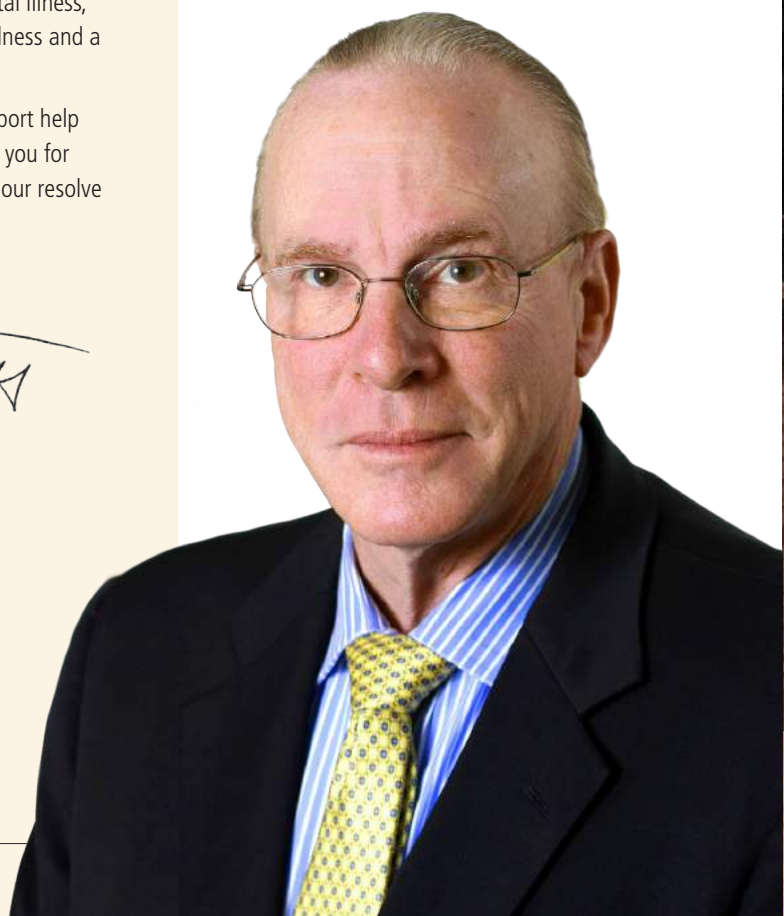
Your continued interest and support help us meet these challenges. Thank you for your commitment, which makes our resolve even stronger.

Sincerely,



Kenneth P. Trevett

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Chuck Slick's tribute to his father Tom Slick

My father was a special man. He was a wonderful father to his children, taking us to many places, introducing us to many interesting people. He was a man of widely varied interests, from oil to cattle breeding, from Bigfoot to big business.

But most of all, he had vision from an early age, that science could help mankind through research, a vision that was embodied in the creation of the Southwest Foundation, as well as the Southwest Research Institute and the Mind Science Foundation, the first such organizations in San Antonio, which really created the biomedical industry in the city.

Unfortunately, his early death posed a challenge to his vision, but it was carried on thanks to the Urschels, the Moormans, the Kerrs, Earl Slick and many, many dedicated and generous donors, some of whom are here tonight, as well as volunteers, and the scientists and staff at the Institute.

One thing that not many people know about my father is that he had a terrible sense of direction and geography. An example of this is the name "Southwest" for two institutions located in Texas. As we all know, New Mexico is located in the Southwest, and Arizona. Texas, on the other hand, is located, well, in Texas. In Atlanta, where I live now, that would be like asking for a Pepsi when you really want a Coke.

Now, however, the Institute is on the cusp of achieving a new level of greatness that would truly make my father proud. With a visionary Board of Trustees, with great leadership on the ground in Ken Trevett and his staff, and with a clear focus, the Institute is about to take a great step forward. Thank you for your continued support.

"THE INSTITUTE IS ON THE CUSP OF *achieving a new level of greatness* THAT WOULD TRULY MAKE MY FATHER PROUD."

— CHUCK SLICK, JANUARY 31, 2011

Dietary restriction early in pregnancy negatively impacts fetal brain development

A RESEARCH TEAM THAT INCLUDES SCIENTISTS FROM THE TEXAS BIOMEDICAL RESEARCH INSTITUTE REPORTED THAT INADEQUATE NUTRITION DURING EARLY PREGNANCY IMPAIRS FETAL BRAIN DEVELOPMENT.



“WE FOUND
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REGULATING THE BASIC
CELLULAR MACHINERY.”

— LAURA COX, PH.D.

The study, published in January 2011 in the *Proceedings of the National Academy of Sciences* and funded by the National Institutes of Health and the German Federal Ministry of Education and Research, also included scientists from the University of Texas Health Science Center at San Antonio (UTHSCSA) and Friedrich Schiller University in Jena, Germany.

“Our collaboration allowed us to determine that the nutritional environment impacts the fetal brain at both the cellular and molecular levels,” said Texas Biomed’s Laura Cox, Ph.D. “That is, we found dysregulation of hundreds of genes, many of which are known to be key regulators in cell growth and development, indicating that nutrition plays a major role during fetal development by regulating the basic cellular machinery.”

The team compared two groups of baboon mothers, one eating as much as they wanted during the first half of pregnancy and the other receiving 30 percent less food, a level of nutrition similar to what many prospective mothers in the U.S. experience. The nonhuman primate model’s

brain developmental stages are very close to those of human fetuses, the researchers noted. Most previous research in this area was conducted in rats.

“This study is a further demonstration of the importance of good maternal health and diet,” said senior author Thomas McDonald, Ph.D., of UTHSCSA. “It supports the view that poor diets in pregnancy can alter development of fetal organs, in this case the brain, in ways that will have lifetime effects on offspring, potentially lowering I.Q. and predisposing to behavioral problems.”

Marked nutrient restriction, such as in famine conditions, adversely affects development of the fetal brain. McDonald said the study “is the first demonstration of major effects caused by the levels of food insecurity that occur in sections of U.S. society and demonstrates the vulnerability of the fetus to moderate reduction in nutrients.”

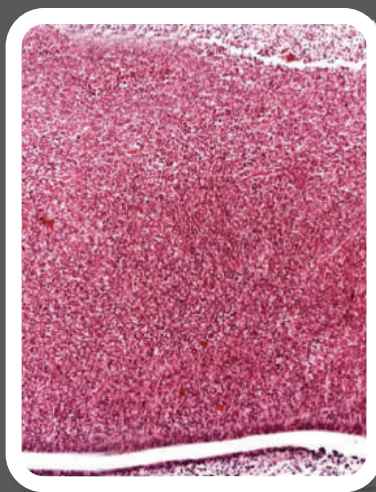
Researchers now must review the commonly held notion that during pregnancy the mother is able to protect the fetus from dietary challenges such as poor nutrition, McDonald said.

“This is a critical time window when many of the neurons as well as the supporting cells in the brain are born,” said Peter Nathanielsz, M.D.,

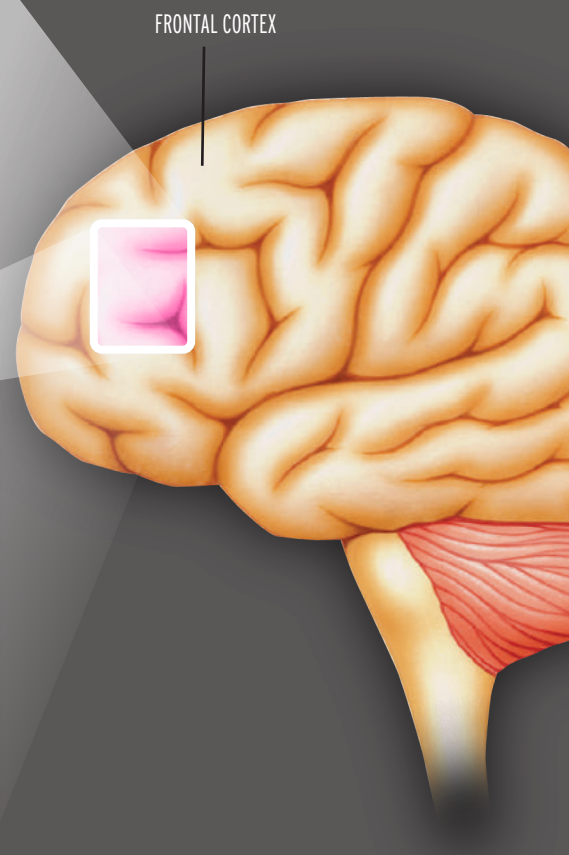
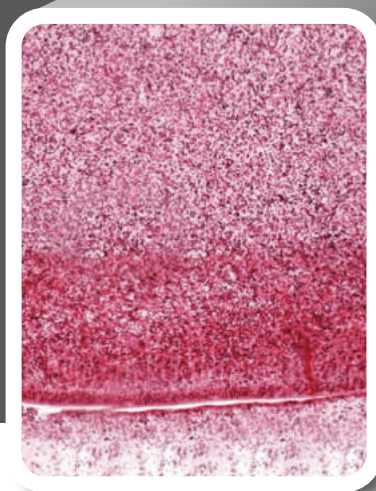
MATERNAL NUTRITION INFLUENCES FETAL BRAIN DEVELOPMENT

Brain images show differences in thickness of a zone of the frontal cortex in the brains of control (top) versus the brains of baboon fetuses (bottom) whose mothers received a nutrient-reduced diet during pregnancy.

Frontal cortex thickness in the brains of baboon fetuses whose mothers had normal diet.



Frontal cortex in the brains of baboon fetuses whose mothers were fed a nutrient-reduced diet.



Brain images from PNAS 2011 108 (7) 3011-3016; published ahead of print January 20, 2011, doi:10.1073/pnas.1009838108

Ph.D., director of the Center for Pregnancy and Newborn Research in the Health Science Center School of Medicine.

Nathanielsz noted:

» In teenage pregnancy, the developing fetus is deprived of nutrients by the needs of the growing mother;

» In pregnancies late in reproductive life, a woman's arteries are stiffer and the blood supply to the uterus decreases, inevitably affecting nutrient delivery to the fetus;

» Diseases such as preeclampsia or high blood pressure in pregnancy can lead to decreased function of the placenta with reduced delivery of nutrients to the fetus.

Developmental programming of lifetime health has been shown to play a role in later development of obesity, diabetes and heart disease. This new finding provides impetus for researchers to look into the effects of developmental programming in the context of autism, depression, schizophrenia and other brain disorders. ■

Researchers **now must review** the commonly held notion that during pregnancy the mother is able to protect the fetus from dietary challenges such as poor nutrition.



Creating new delivery systems for cancer drugs

By engineering the surface of a harmless virus that infects bacteria, known as a bacteriophage or phage, scientists at Texas Biomed and the University of Oklahoma hope to generate a molecular “ferry” to transport anti-cancer drugs to the sites where they are needed most.

The work reported in the journal *Molecular Cancer Therapeutics* and led by Chuanbin Mao, Ph.D., of the University of Oklahoma, relied on engineering negative charges onto the phage’s filamentous body so that they would attract positively charged liposomes. Liposomes are tiny bubbles of liquid enclosed within an artificial membrane and in this case the liquid contains the anti-cancer drug zinc naphthalocyanine (ZnNC).

At specific ratios of phage and liposomes, a microscopic web of interwoven phage and liposomes was formed that was visible by high-powered electron microscopy. These

“nanoweb” were found to deliver their cargo of ZnNC to model cancer cells grown in a Petri dish more effectively than liposomes alone and caused cancer cell destruction after photoactivation, said Texas Biomed virologist Andrew Hayhurst, Ph.D.

ZnNC belongs to a class of anti-cancer therapeutics that rely on being activated and able to trigger cell death only after exposure to light, enabling a very selective and controlled regime to be established using diode lasers and optical fibers to minimize damage to non-cancerous areas. The scientists hope that by engineering the phage further with a tumor homing molecule, they will be able to specifically deliver ZnNC to cancer cells; these studies are now underway. ■

THESE “NANOWEBS”
*caused cancer cell
destruction* AFTER
PHOTOACTIVATION.

— ANDREW HAYHURST, PH.D.

TARGETED CANCER ATTACK

ANTICANCER DRUG

LIPOSOME
(POSITIVELY
CHARGED)

1 Anti-cancer drug is encased within an artificial membrane. These formations are called liposomes.

PHAGE
(NEGATIVELY
CHARGED)

2 When mixed with engineered phage, these liposomes form a microscopic web, or “nanoweb,” which deliver their “cargo” anticancer agent.

PHOTOACTIVATION

RELEASED AND ACTIVATED
ANTI-CANCER AGENT

3 Once the “nanoweb” reaches the model cancer cells, it is exposed to light, which triggers cell death.

CANCER CELL



'Sergeant' Leroy Wertz retires after 43 years at Texas Biomed

Leroy W. Wertz's name could appear in Guinness World Records as the person who best defines the words "consistent" and "reliable." Here's why:

- » At age 80, he retired in December 2010 after 43 years at Texas Biomed, including nearly two decades in Shipping and Receiving. He was known campus wide as the man who delivered the mail.
- » Wertz and his wife, Betty, have been married for 62 years.
- » They have lived in the same house in southeastern San Antonio for 45 years where they moved as Leroy was nearing the end of a 20-year career with the U.S. Army.

"In everything Leroy did here, he truly set a high standard to which all of us should aspire," said Kenneth P. Trevett, Texas Biomed's president and CEO.

He saw a great opportunity to put to good use his Army experience in the care of animals. When asked how long he planned to stay, he said, "Forever."

SNAPSHOT:

Name: Leroy Wertz

Most Recent Position: Mailroom - Shipping and Receiving

Years at Texas Biomed: 43

Background: Served in the Army; worked as a veterinary, surgical and medical technician

Other: Daughter works in Texas Biomed's Purchasing Department

After retiring in 1967 from his Army post at Fort Sam Houston, Wertz heard about an opening in the Department of Laboratory Animal Medicine at Texas Biomed, which was then named the Southwest Foundation for Research and Education. He saw a great opportunity to put to good use his Army experience in the care of animals. When asked by the job interviewer how long he planned to stay, he said, "Forever."

And he might have stayed longer than 43 years if his legs weren't starting to give him trouble. Those legs walked literally thousands of miles around the Institute's campus, since he started delivering the mail in the late 1980s.

Wertz is way overdue for a break. He grew up in rural western Pennsylvania on a farm with no running water or electricity. His first job was in a coal

mine at age 10. He joined the Army at age 17 and gained valuable experience as a veterinary, surgical and medical technician, and traveled as far away as Korea.

Wertz brought that veterinary and other medical experience, along with his military background, to Texas Biomed.

"A retired Army lifer with a buzz cut that rarely grew longer than one-eighth inch," is how John Bernal, D.V.M., now assistant director for veterinary resources at Texas Biomed's Southwest National Primate Research Center, described Wertz. Bernal reported to Wertz during the late 1970s. "It did not take long for Leroy to be known as Sergeant Wertz," Bernal recalled at a retirement event for Wertz. "This was a term of endearment that Leroy would never deny."

Wertz was a stickler for cleanliness, especially the daily floor-mopping ritual. "Sergeant Wertz, you probably never thought you would have such a lasting impact on Bernal," Bernal said, smiling at the new retiree. "But you cared, you cared about Texas Biomed and you cared about the people who served the Institute. You were respected for your conviction that if we were going to do something, no

“YOU WERE RESPECTED
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*do it right
and to the best of
our ability.”*

— JOHN BERNAL ON LEROY WERTZ

matter what it was, do it right and to the best of our ability.”

One of Wertz's fondest memories is the time he helped nurse day and night a gravely ill baboon back to health. “It felt good that we did something really special for an animal, because without these animals, we wouldn't have a job,” Wertz recalled. “And we wouldn't have the benefit of research that they make possible.”

His wife, Betty, said she enjoyed having her husband work at Texas Biomed because the job made him consistently happy. “I wish I could do it all over again, but I've worked enough,” Leroy Wertz said.

Leroy and Betty Wertz have two daughters, Lucy Oncken and Ella Gerben — who works in Texas Biomed's Purchasing Department.

He now plans to spend more time with his wife, children, three grandchildren and seven great-grandchildren and surf fishing at Port Aransas. And no doubt, he'll put to very good use that new rod and reel he received at his retirement event.

And while he no longer walks the Texas Biomed campus delivering mail, Leroy Wertz's work ethic lives on. ■

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IN THE NEWS



Texas Biomed President Kenneth Trevett becomes chair of BioMed SA

IN THE FIRST VOLUNTEER LEADERSHIP TRANSITION IN ITS FIVE-YEAR HISTORY, KENNETH P. TREVETT HAS BEEN ELECTED TO SUCCEED FOUNDER HENRY G. CISNEROS, A FORMER SAN ANTONIO MAYOR AND CABINET SECRETARY, AS CHAIR OF BIOMED SA'S EXECUTIVE COMMITTEE. CISNEROS WILL CONTINUE TO SERVE ON THE COMMITTEE UNDER TREVETT'S LEADERSHIP IN 2011. TREVETT HAS LED TEXAS BIOMED SINCE SEPTEMBER 2008.

"SAN ANTONIO CAN
AND WILL BE *the
next hub for
biomedicine in
this country.*"

— KENNETH P. TREVETT

BIOMED SA:

Formed: 2005

Mission: To organize and promote San Antonio's healthcare and bioscience assets to accelerate growth of the sector and enhance San Antonio's reputation as a city of science and health.

Website: www.biomedsa.org

"Ken's 30 years of broad-based industry experience and collaborative leadership style make him a natural choice to lead our collective efforts to position San Antonio as a global leader in healthcare and bioscience," Cisneros said. "I look forward to serving another year on the Executive Committee under Ken's leadership and alongside the outstanding cross-section of leaders representing all segments of San Antonio's healthcare and bioscience sector."

Trevett said, "Henry's shoes will be tough to fill, but with the continued executive leadership of President Ann Stevens and the combined efforts of a strong and representative Executive Committee,

we will continue to aggressively and productively advocate for San Antonio's biomedical sector. I am convinced San Antonio can and will be the next hub for biomedicine in this country, and in accordance with our newly adopted strategic plan, BioMed SA will lead the charge for San Antonio's recognition as a global leader in healthcare and bioscience."

Cisneros, Executive Chairman of CityView, founded BioMed SA with the help of The Greater San Antonio Chamber of Commerce in 2005 to organize and promote San Antonio's extensive healthcare and bioscience assets and establish its reputation as a City of Science and Health. Cisneros was a four-term mayor of San Antonio in the 1980s and served as Secretary of Housing and Urban Development in the Clinton administration.

BioMed SA has significant momentum going into 2011 as a result of its role in the recruitments of Medtronic Diabetes and InCube Labs, in San Antonio Days at the Shanghai World Expo, and in the growing stature of its Julio Palmaz Award and other initiatives, Cisneros said. "I am tremendously proud of BioMed SA and am confident that it has reached the level of maturity for others to take the lead and guide its future direction." ■