Forum in Focus

SPRING 2013

President's Letter


Julie Zacher

It's amazing how time really does fly when you are having fun! I can't believe that I am writing my final President's letter. I feel I was just doing this in the fall.

We've had a most exciting and successful year and have many people to thank for that.

March kicked off our membership drive for the year and I hope you have all renewed – or plan to soon – for 2013-2014! This organization truly could not accomplish all that it does without the hard work and participation of its membership. Membership Chair **Wendy Garcia** has worked for two years to strengthen our membership and make renewing easier than ever. You can renew online and save a stamp!

On March 27th we had our annual Spring Lecture Luncheon and Science Education Awards at the Argyle. **Cathryn LeVrier** and **Leslie Miller** coordinated a lovely – and *healthy* – luncheon we enjoyed while listening to Texas Biomed scientist, **Anthony Comuzzi, Ph.D.** as he delivered a fascinating talk on "Food for Thought: Diet and Genes in Disease Risk". It's safe to say no one ordered seconds for dessert!

Also at this luncheon, our Science Education Award winners were announced. Many local high school science teachers compete for these grants by submitting applications outlining a specific project or study they hope to implement in their classes with the award money. It's amazing to hear about these innovative projects each year and to realize that these teachers are true champions for our kids as well as the future of science and research. **Ashley Hixon** and **Jody Lutz** chaired the awards process, and with the help of a panel of scientists from Texas Biomed, awarded 6 schools with monetary prizes. You can read more about the winning schools later in this newsletter.

This spring also marked the conclusion of our student tours of Texas Biomed for the year. We had more tours this year than ever before and have already begun scheduling tours for the 2013-2014 school year. The success of the student tours is dependent on the hard work of many. **Ann Cross** and **Sonya Medina Williams** have worked tirelessly on this project for the last two years, and were joined this year by **Monica Iacobucci**. Special thanks also to the trustees and forum members who volunteered to host these tours, as well as the staff and scientists at Texas Biomed who helped to inspire these young minds!

In February, our friends at Neiman Marcus hosted us for a spring style show and evening gown preview. Members sipped champagne and mojitos while taking in the latest fashions for spring. Thanks to **Tracee Feik** and **Raven Labatt** for helping to coordinate this special event for the Forum.

We conclude our membership year with the annual Gala – the grand finale to a great year! On May 4th, Gala Chairs **Melissa Morgan** and **Courtney Duphorne** and Gala Assistant **Daniela Serna**, along with their hardworking committee, are taking us to Havana, Cuba for ***La Gloria Havana***. The final details

(Continued on Page 2)

The purpose of the Texas Biomedical Forum is to support the Texas Biomedical Research Institute through community relations, volunteer service and fundraising.

President's Letter

(Continued from Page 1)

are underway for what promises to be another spectacular evening at the Argyle, while raising much needed money for pilot study research at Texas Biomed. An event like this is many months in the making and requires an enormous amount of volunteer hours. Thank you to the numerous people who gave their time, talent and resources.

Like I said, it has indeed been a fun year. I have had the privilege of working with some of the most talented and capable women in San Antonio who are the core of this organization. Being President is truly a joy when everyone not only does their job, but does it extremely well and so many people are supportive of the cause. I feel confident that we are successful in making a difference in our community, whether it's an inspired student, a grateful teacher, or a scientist with potentially groundbreaking research that needs initial funding. Many people make these things happen. I am grateful to you all. Thank you for this experience. This month I pass the gavel, leaving you in great hands with my successor and good friend, Cathryn LeVrier.

Julie Zacher
President 2012-2013

Student Tours of Texas Biomedical Research Institute were in high demand for the 2012-2013 school year

In addition to the Fall tours, this winter, the Forum hosted six area schools. All 10 slots are already filled for the upcoming 2013-2014 school year. Forum trustees Ann Cross, Monica Iacobucci and Sonya Medina Williams have found working on student tours to be a very rewarding experience. Thank you to all our winter Forum volunteers: Amanda Bezner, Tracee Feik, Ashleey Hixon, Jody Lutz, Sheila Mayfield, Melissa Morgan, Carla Nelson, and Ann Walton. A special thank you to Amy Abdalla, Associate Advancement Officer at TBRI, and all the resident scientists who gave their time to educate the students about their research and the incredible work of the Texas Biomedical Research Institute.

READY TO TRAVEL TO . . . LA GLORIA HAVANA?

The excitement is building as final preparations are being made for the 2013 Texas Biomedical Forum Gala! Get ready to travel to the land of Cuba and enjoy "La Gloria Havana" at The Argyle on Saturday, May 4th from 6:00 p.m. to 12:00 a.m.

Imagine this . . . arriving at The Argyle and being greeted with delicious drinks with a Cuban flare to sip on . . . enjoying unbelievable Cuban inspired food that you are sure to love . . . making a pit stop at the hand rolled cigar tent or the cool lipstick bar . . . dancing the night away to the sounds of DJ Lucy at the "Havana de Noche" After Party . . . visiting the Gala photo booth . . . entertaining yourself at the poker, blackjack or craps gaming tables . . . and ending the night satisfying your midnight cravings by eating delectable tacos.

Don't forget to purchase your raffle tickets for a chance to win any of the six fabulous packages . . . Comfort at Home; A Man's Dream; A Beautiful Life; VIP at Neiman Marcus; A Glorious Night at The Argyle; and Julian Gold Shopping Extravaganza. All are packages that you will love! Tickets are $50 each. There will also be a Surprise Raffle at the event, so be ready to purchase your tickets for this special drawing.

Remember to spread the word about the "Havana de Noche" After Party. The party starts at 9:00 p.m. and tickets are $100 per person. Come enjoy drinks, dancing and gaming fun . . . you just won't want to miss it!

The 2013 Gala Committee has worked so hard to make sure everyone has a perfect night. Perhaps most importantly, all proceeds from this wonderful event advance scientific research directly by funding pilot studies at the Texas Biomedical Research Institute. Help us make it a great success!

Finalize your Cuban wardrobe and join us at La Gloria Havana 2013!

NEIMAN MARCUS TRIBUTE

On February 6, 2013, Texas Biomedical forum and Neiman Marcus paired up for a fabulous evening in tribute to this years gala theme, La Gloria Havana, organized by special event chairs Raven Labatt and Tracee Feik. Guests enjoyed cocktails, light bites and a runway show that left us with a few ideas on what to wear to this years gala. 100% of the proceeds were donated to the Texas Biomedical Research Institute.

Outstanding Lecture Luncheon

We hope you were able to join us for our Spring Lecture Luncheon, held on March 27th at The Argyle! It was a great success with the announcement of our Science Education Award winners, followed by a very informative and interesting lecture.

Our featured speaker, Dr. Anthony Comuzzie, Scientist Genetics and SNPRC, at Texas Biomedical Research Institute, spoke on “Food for Thought: Diet and Genes in Disease Risk”

A recognized authority in the genetics of obesity, Comuzzie continues to investigate the complex picture of how genetics and diet influence a wide array of medical issues including diabetes, heart disease, brain functioning and even prenatal development. Several years ago, his lab developed and tested a “challenge” diet for baboons that duplicated the fat, sugar, salt and caloric content of the typical fast food meal that is the mainstay of so many Americans’ diets. His pilot studies demonstrated

(Continued on Page 4)

Lecture Luncheon

(Continued from Page 3)

how the combination of fat and sugar especially accelerated development of obesity and metabolic dysfunction in this research model for human atherosclerosis and diabetes. Since then, Comuzzie's lab joined with researchers around the world who are adapting this diet for use with other non-human primate models in the study of prenatal development, diabetes, cardiovascular disease and cancer risk.

With its recent investments in state-of-the-art gene sequencers, upgraded computer firepower and well-characterized family study populations, Texas Biomed scientists have unparalleled resources for investigating heritable factors that influence obesity and comorbidities.

Comuzzie's research also recently developed new information about the melanocortin 4 receptor gene that previously was linked to rare but heritable cases of extreme obesity. Analysis of the Viva La Familia family study data have identified other variants of the same gene that are more common and that cause more moderate effects in a greater number of people. Comuzzie has shown that this gene is a significant player in the problem of obesity.

While everyone would probably agree that we are so fortunate to have such an important and accomplished research facility like Texas Biomed in our city, it's a special treat to hear one of our Scientists speak about how they are doing things every day to advance the industry's knowledge.

Science Education Awards

The Texas BioMedical Forum, in cooperation with the V. H. McNutt Memorial Foundation, offers a yearly opportunity for teachers to apply for science education grants. The goal is to assist in the purchase of teaching materials for new and innovative programs that further the students' interest and knowledge of science.

Public and private high school teachers in Bexar County as well as its contiguous counties are invited to participate. The awards are given to the six teachers who submit proposals demonstrating the strongest commitment to the further development of visionary and progressive science education programs.

The winners are determined by a panel of judges consisting of a representative from the V.H. McNutt Memorial Foundation, Texas Biomedical Research Institute scientists and the Science Education Awards Coordinators from the Texas Biomedical Forum Board. As always, we wish to thank Valerie Guenther of the V.H. McNutt Foundation, for her time and input.

We would also like to thank Rebecca Rabel for her assistance with the applications as well as the TBRI scientists who served as judges and provide invaluable insight: Dr. Lorena Havill, Dr. Jera Pecotte and Dr. Karen Rice.

This year, over $20,000 was awarded jointly by the TBF and the V.H. McNutt Memorial Foundation. Additionally, due to a generous donation by the L.D. Ormsby Foundation we were able to offer teachers who submitted their proposals by the application deadline a $50 personal stipend for taking the time to apply. A $200 participatory stipend was also available to schools who did not place in the top six.

The deserving winners for 2013 are as follows:

1st place (tie)
$6125
Gerri Butler
Medina Valley High School
"Forensic Anthropology:
Investigating Human Bones"

1st place (tie)
$6125
Colin Lang
Alamo Heights High School
"Aeroscience Studies, Goddard Level"

3rd place $3500
Layne Steinhelper
Keystone School
"Toying with Energy"

4th place
$2500
Alexandra Rios
Edison High School
"Scientist, Framing the
Pathway to
Science Careers"

5th place
$1500
Jason Nydegger
Keystone School
"Autoclave Funding"

Honorable Mention
$500
Robin Howard
Robert E. Lee High School
"Sustainable Agriculture
Combined with Aquatics
for Aquaponics System"

Texas Biomed Updates

HIGHLY LETHAL EBOLA VIRUS HAS ACHILLES' HEEL FOR BIOTHREAT DETECTION, SCIENTISTS SAY

By screening a library of a billion llama antibodies on live Ebola viruses in Texas Biomed's highest bio-containment laboratory, scientists have identified a potential weakness in the make-up of these deadly agents that can immediately yield a sensitive test.

"Detecting single viral protein components can be challenging, especially at very low levels. However, most viruses are repetitive assemblies of a few components, called antigens, with some existing as polymers which present highly 'avid' targets for antibodies," said Texas Biomed virologist Andrew Hayhurst, Ph.D.

"Think of one pair of microscopic Velcro hooks where one hook is the viral antigen and the other is the antibody and it is a weak interaction. Have a thousand pairs of hooks and it makes a very powerful interaction . . . just like Velcro fasteners on hiking gear," Hayhurst explained.

The screening performed by Hayhurst and assistant Laura Jo Sherwood guided the selection of llama antibodies recognizing a polymer hiding within Ebola called nucleoprotein (NP). Remarkably, each antibody could be used in its own right to form a sensitive test for the Ebola NP, whereas most tests would require two different antibodies driving up costs and characterization times.

This research – funded by National Institutes of Health, Defense Threat Reduction Agency Basic Science Program/ Office of Naval Research and the Texas Biomedical Research Institute – was published in April in the journal *PLOS ONE*.

Andrew Hayhurst, Ph.D.

"Ebola NP is rather like a cob of corn displaying hundreds of kernels linked in a repetitive polymer, giving us the perfect molecular magnet to attract llama antibodies that can be assembled into highly avid assays based on a single antibody," Hayhurst said.

"Intriguingly, while using one anti-body to polymers and aggregates has been put to use in neurodegenerative disease diagnostics for Parkinson's, Alzheimer's and other disorders, it has lagged behind in emerging viral diagnostics. We showcase its simplicity and effectiveness for viral threat detection here and it may well be useful for detecting other emerging viruses."

Gum disease found to worsen infection in animal model of AIDS; may slow treatment effect in early stages of disease

Texas Biomed scientists have found that moderate gum disease in an animal model exposed to an AIDS-like virus had more viral variants causing infection and greater inflammation. Both of these features have potential negative implications in long term disease progression, including other kinds of infections, the researchers say in a new report.

> "This is important because moderate gum disease is present in more than 50% of the world population."
>
> – Luis Giavedoni, Ph.D

The public health message from the study is that even mild inflammation in the mouth needs to be controlled because it can lead to more serious consequences, said Luis Giavedoni, Ph.D., a Texas Biomed virologist and first author of the study.

"This is important because moderate gum disease is present in more than 50

(Continued on Page 7)

(Continued from Page 6)

percent of the world population. It is known that severe gum disease leads to generalized inflammation and a number of other health complications, but the conditions that we created were moderate and they were mainly localized in the mouth," he added.

"After infection with the simian AIDS virus, the generalized acute inflammation induced by the virus was exacerbated in the animals with gingivitis, indicating that even mild localized inflammation can lead to a more severe systemic inflammation," he added.

The study, funded by the National Institutes of Health and conducted at Texas Biomed's Southwest National Primate Research Center, appeared in the February 2013 issue of the *Journal of Virology.*

Collaborators included scientists at the Dental School at UT Health Science Center San Antonio and at Seattle Biomed in Washington State.

Luis Giavedoni

Giavedoni and his colleagues studied whether inflammamouth would increase the susceptibility of the monkeys to becoming infected with the monkey AIDS virus. This was based on epidemiological evidence that shows that infection and inflammation of the genital mucosa increases the chances of becoming infected with HIV by the sexual route.

The scientists induced moderate gum inflammation in a group of monkeys, while a second group without gum inflammation served as a control. After exposing both groups of macaques to infectious SIV, a monkey virus similar to AIDS, in the mouth they did not observe differences in the rate of infection, indicating the moderate gum disease did not increase the chances of getting infected with the AIDS virus.

"However, we did observe that the animals that had gum inflammation and got infected had more viral variants causing infection and they also showed augmented systemic inflammation after infection; both of these findings may negatively affect the progression of the viral infection." Giavedoni said.

Stem cells found to heal damaged artery in lab study; raises hope for developing new therapies for many diseases

Scientists at the Texas Biomed have for the first time demonstrated that baboon embryonic stem cells can be programmed to completely restore a severely damaged artery. These early results show promise for eventually developing stem cell therapies to restore human tissues or organs damaged by age or disease.

"We first cultured the stem cells in petri dishes under special conditions to make them differentiate into cells that are the precursors of blood vessels, and we saw that we could get them to form tubular and branching structures, similar to blood vessels," said John L. VandeBerg, Ph.D., Texas Biomed's chief scientific officer.

This finding gave VandeBerg and his team the confidence to do complex experiments to find out if these cells could actually heal a damaged artery. Human embryonic stem cells were first isolated and grown in 1998.

> "[Cells derived from embryonic stem cells] . . . are promising thereapeutic agents for repairing damaged vasculature of people." – study co-authors Qiang Shi, Ph.D. of Texas Biomed and Gerald Shatten, Ph.D., of the Univ. of Pittsburgh

The results were published in a paper, co-authored by Texas Biomed's Qiang Shi, Ph.D., and Gerald Shatten, Ph.D., of the University of Pittsburgh, published in the January 10, 2013 issue of the *Journal of Cellular and Molecular Medicine.*

(Continued on Page 8)

(Continued from Page 7)

The scientists found that cells derived from embryonic stem cells could actually repair experimentally damaged baboon arteries and "are promising therapeutic agents for re-pairing damaged vasculature of people," according to the authors.

John L. VandeBerg, Ph.D.

Researchers completely removed the cells that line the inside surface from a segment of artery, and then put cells that had been derived from embryonic stem cells inside the artery. They then connected both ends of the arterial segment to plastic tubing inside a device called a bioreactor which is designed to grow cells and tissues. The scientists then pumped fluid through the artery under pressure as if blood were flowing through it. The outside of the artery was bathed in another fluid to sustain the cells located there.

Three days later, the complex structure of the inner surface was beginning to regenerate, and by 14 days, the inside of the artery had been perfectly restored to its complex natural state. It went from a nonfunctional tube to a complex fully functional artery.

"Just think of what this kind of treatment would mean to a patient who had just suffered a heart attack as a consequence of a damaged coronary artery. And this is the real potential of stem cell regenerative medicine—that is, a treatment with stem cells that regenerates a damaged or destroyed tissue or organ," VandeBerg said.

To show that the artery couldn't heal itself in the absence of stem cells, the researchers took a control arterial segment that also was stripped of the cells on its interior surface, but did not seed it with stem cells. No healing occurred.

Stains for proteins that indicate functional characteristics showed that the healed artery had completely normal function and could do everything that a normal artery does in a healthy individual. "This is evidence that we can harness stem cells to treat the gravest of arterial injuries," said VandeBerg.

Eventually, scientists hope to be able to take a skin cell or a white blood cell or a cell from any other tissue in the body, and induce it to become just like an embryonic stem cell in its capacity to differentiate into any tissue or organ.

"The vision of the future is, for example, for a patient with a pancreas damaged because of diabetes, doctors could take skin cells, induce them to become stem cells, and then grow a new pancreas that is just like the one before disease developed," VandeBerg said.

Texas Biomed awarded $2 million to look for biological markers of treatment efficacy for Chagas disease, a leading parasitic killer

Texas Biomed has received $2 million to identify new ways of determining treatment efficacy in Chagas disease, a potentially fatal tropical disease that affects nearly eight million people throughout the world and hundreds of thousands in the United States.

The organization Drugs for Neglected Diseases initiative (DNDi) received an award of $3 million from the Wellcome Trust, about $2 million of which will go to Texas Biomed as a sub-contractor. John L. VandeBerg, Ph.D., Texas Biomed's chief scientific officer, is the organization's principal investigator on the project.

The announcement was made in November, 2012 at the 61st Annual Meeting of the American Society of Tropical Medicine and Hygiene in Atlanta.

Chagas disease is the leading parasitic killer in the Americas, where it causes more deaths than malaria. In the United States, the Centers for Disease Control and Prevention estimates that 300,000 or more are infected. Moreover, health officials say that in South Texas they have identified increased numbers of 'kissing bugs' that carry the parasite that causes the disease.

(Continued on Page 9)

(Continued from Page 8)

No easy-to-use and reliable test available can now assess if Chagas patients are rid of the parasite after treatment. Current treatment options have significant limitations due to safety considerations, inconsistent efficacy, and long treatment duration. Determining if treatment has cured the infection requires difficult and lengthy repeat laboratory testing that can sometimes take decades due to the unusual chronic nature of the disease.

> "The results of this study could encourage treating more patients now . . . and facilitate future clinical trials of new treatments."
>
> – Graeme Bilbe, Ph.D., Research & Development Director for DNDi

Patients and physicians are often skeptical of the benefit of treatment for the chronic, indeterminate form of Chagas without a direct way to measure cure. A new, robust test for the disease burden would help to expand treatment, as well as provide a valuable tool for accelerating the evaluation of new drugs in clinical trials.

The $3 million Wellcome Trust Award will fund the first-ever large-scale study involving treatment of non-human primates (macaques) naturally infected in their outdoor living environment with the parasite that causes Chagas disease, *Trypanosoma cruzi.* The animals will be treated with three drug regimens versus placebo: benznidazole at optimal dose, benznidazole at suboptimal dose, and another azole compound with anti-parasite activity. Over a period of 12 months after treatment, the animals will be examined for clearance of the Chagas parasite through polymerase chain reaction (PCR) and other tests. The primary goal of the study is to see if these tests can accurately measure parasitological cure.

"We established the monkey model for research on Chagas disease because progress has been extremely slow in developing candidate treatments for it, and even slower in developing ways to assess the efficacy of candidate treatments," said VandeBerg. "The research supported by this grant will greatly enhance our capacity to assess the efficacy of existing candidate treatments for Chagas disease, as well as those that will be developed in the future."

"We need to be able to tell patients whether or not their treatment has worked," said Graeme Bilbe, Ph.D., Research and Development Director for DNDi. "The results of this study could encourage treating more patients now, with what we have, and facilitate future clinical trials of new treatments for chronic Chagas disease patients."

The project was initiated by VandeBerg and Rick Tarleton, Ph.D., of the Center for Tropical and Emerging Global Diseases at the University of Georgia. The study will be coordinated by DNDi with these partners and will begin within months and run until 2015. Texas Biomed will conduct the experimental protocols with the animals and will conduct biomarker analysis, along with the University of Georgia. Other partners conducting testing will be the University of Texas at El Paso, and the Argentinean National Council of Scientific and Technical Investigation. To facilitate future biomarker discovery efforts, the biological samples collected in the study will be stored at Texas Biomed and made available to other researchers.

Chagas disease is endemic in 21 countries across Latin America, where it kills more people than any other parasite-borne disease, including malaria. It currently infects approximately 8 million people, kills an estimated 12,000 per year, and places 100 million people at risk. Chagas disease is a chronic, systemic, parasitic infection caused by the protozoan Trypanosoma cruzi. In 30-40 percent of cases, chronic Chagas disease affects the heart and/or the digestive system. It is potentially fatal and the leading cause of heart failure in Latin America, resulting in frequent and prolonged hospitalization, use of pacemakers and defibrillators, and heart transplants. The disease causes loss of productivity among tens of thousands of young, working-age adults across Latin America, with over a billion dollars in estimated economic losses annually. As a result of worldwide population flow, Chagas disease is no longer confined to Latin America, with patient numbers growing in the United States, Europe, Australia, and Japan.

TEXAS BIOMEDICAL FORUM
2012-2013 BOARD OFFICERS

Julie Zacher
President

Cathryn LeVrier
First Vice-President, Lecture Luncheon

Melissa Morgan
Second Vice-President, Gala Chair

Courtney Duphorne
Third Vice-President, Gala Co-Chair

Wendy Garcia
Fourth Vice-President, Membership

Courtney Percy
Treasurer

Sheila Mayfield
Assistant Treasurer

Kathleen LeFlore
Recording Secretary

Chancey Stuart
Corresponding Secretary

Suzanne Dabbous
Immediate Past President

TEXAS BIOMEDICAL FORUM
2012-2013 BOARD OF TRUSTEES

Julie LaBarba Miggins
Archivist

Melinda Hart
Database Coordinator

Sara McCamish
Directory

Lisa Westmoreland
Directory

Amanda Bezner
Education Liaison

Daniela Serna
Gala Assistant

Tracy Williams
Historian

Leslie Miller
Luncheon Assistant

Carla Nelson
Newsletter

Shannon Turner
Newsletter

Ann Walton
Parliamentarian

Sarah Moore
Photographer

Anne Seay
Public Relations

Gretchen Herrmann
Roundtable Discussion

Victoria Roca
Roundtable Discussion

Ashley Solcher Hixon
Science Education Awards

Jody Lutz
Science Education Awards

Raven Labatt
Special Events

Tracee Feik
Special Events

Ann Allen Cross
Student Tours

Monica Iacobucci
Student Tours

Sonya Medina Williams
Student Tours

Lisa Miller
Volunteers

Elizabeth Carrington
Website Liaison

Advisors
Terry Gouger
Allison Zeller

TEXAS BIOMEDICAL FORUM
P.O. Box 6648
San Antonio, Texas 78209

Non-Profit Org.
U.S. Postage
PAID
San Antonio, Texas
Permit No. 2193