



PROGRESS

Winter 2016

From Birth Through Aging

Texas Biomed scientists impacting health at every life stage



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Living with Purpose

Anysha Ticer: changing lives in and out of the lab

Anysha Ticer, a senior research associate in the Virology and Immunology Department, has honed her organization, protocol and team work skills. She assists with research on the world's deadliest pathogens, for which there are no cures and no vaccines, in Texas Biomed's Biosafety Level 4 laboratory.

Her work, as part of the V&I team, aims to understand and stop the threat of viruses to both humans and animals. The vigilance and care she exhibits every day on the job prepared her well for her volunteer role as a court appointed special advocate.

As a volunteer advocate with Child Advocates of San Antonio (CASA) for the past three years, Ticer serves the best interests of children who have entered state protective custody. Her aim is to find these children a safe, secure place to live and thrive. She has worked with two families and is currently working with a third family.

"I am an advocate for children who have been abused or neglected, and my heart breaks for them," Ticer said. "I get to be their voice while working with CPS, Bexar County judges, teachers, counselors and attorneys. All are addressing the diverse needs of these children to find them a safe, secure place."

According to their website, the mission of Child Advocates San Antonio (CASA) is "to recruit, train, and supervise court-appointed volunteer Advocates who

provide constancy for abused and neglected children and youth while advocating for services and placement in safe and permanent homes."

Ticer said God called her to serve the underserved, and in her search, CASA was the answer to that call.

"I get to be a voice for children involved in court cases and help determine how to best meet their needs," Ticer said.

She described her role as the hands and feet of the judge in each case, doing the ground work.

"I was sworn in, and I have authority to gather information about the children when it comes to education, health and family," Ticer explained. "I also work with the children by simply being there for them, showing them love and kindness, helping with homework and taking them to places like the movies, museum, etc."

Ticer was recently recognized and featured in a 2015 CASA public service announcement, which encouraged others to get involved as volunteers.

Both her job at Texas Biomed and as a volunteer with CASA require organization and commitment, but it's her passion for service that drives Ticer's success in the lab and in the courtroom.

Finding Hope for Babies Born with HIV

Texas Biomed receives \$5 million NIH grant

As a physician, Dr. Ruth Ruprecht, Scientist in the Department of Virology and Immunology and Director of the Texas Biomed AIDS Program, remembers treating patients in the early days of the epidemic when symptoms couldn't be explained.

As both an M.D. and a Ph.D., Dr. Ruprecht has had a unique opportunity to attack HIV/AIDS from both the bench and the bedside. After more than 30 years in the fight, a lot of progress has been made, but there is still no cure and no vaccine.

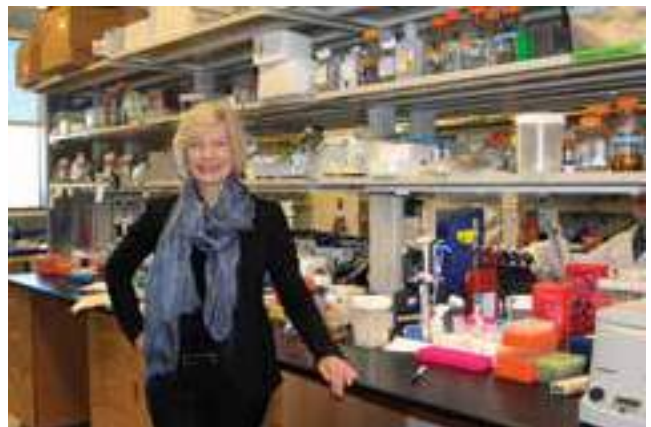
And, according to the World Health Organization, of the nearly 37 million people living with AIDS worldwide in 2014 nearly 2.6 million were children and about 220,000 children became newly infected last year.

With a newly awarded \$5 million grant from the National Institutes of Health, Dr. Ruprecht is leading a study with collaborators at the Food and Drug Administration, UCLA and the University of Pennsylvania over the next 4 years to investigate a combination of antiviral drugs and investigative AIDS vaccines aimed at treating infants and children affected by HIV.

“Our goal is to determine whether these candidate vaccines, partnered with antiviral drugs, will not only completely

suppress HIV replication in babies infected with HIV at birth, but will also induce such strong antiviral cellular immune defenses that the virus will not reemerge after all treatment is stopped,” Ruprecht said. “We will test our concepts in infant and neonatal rhesus monkeys. These primate models will allow us to assess whether the virus can be cleared from tissue reservoirs and whether long-lasting protective immunity has been generated by the combined treatment.”

While current HIV therapies called highly active anti-retroviral therapy (HAART) can suppress the virus, HAART is not a cure. HAART has proven effective at inhibiting and suppressing the replication of the virus, but once an HIV-infected person stops taking the drugs, the virus comes back.



Ruprecht explained, “We will provide HAART to infant monkeys to suppress the virus so the animals will no longer be viremic (show virus in the blood). Once the virus is shown to be suppressed, we will give them a combination rubella vaccine that has pieces of the SHIV (simian human immunodeficiency virus) inserted into the vaccine. This vaccine vector is so potent it induces a very strong immune response. Once HAART is stopped, our hope is that the vaccine-induced immune cells take over.”

Due to the prior vaccination, the immune system will be able to recognize viral proteins displayed on cells

Ruprecht is coordinating this study with Ira Berkower, M.D., Ph.D. U.S. Food and Drug Administration, who has performed the initial testing of the rubella vector-based vaccine, along with Yvonne J. Bryson, M.D., Chief of Pediatric Infectious Diseases at UCLA, and Sarah J. Ratcliffe, Ph.D., Associate Professor of Biostatistics at the Perelman School of Medicine, University of Pennsylvania who will provide biostatistical input to the study.

Ruprecht and her collaborators aim for this combined therapy approach to generate a functional cure, meaning it would rid the blood of the virus and



still infected with HIV that tell if the cell is infected. T cells in the body then recognize the infected cells and kill them.

“We are planning to induce strong killer cell activity,” Ruprecht said, “These cells will patrol the body and take out AIDS virus-infected cells that become activated once HAART has been stopped. We hope over time this patrolling and cell killing will shrink the virus reservoir and there will be fewer cells left in the body able to activate the virus.”

eliminate the negative effects of HIV – without the need of continued HAART. At the same time, the combined approach could provide immunity against future HIV exposure.

“We are excited to launch this study and develop an attack plan against HIV that could both cure and provide a solid defense against further infection,” Ruprecht said.

Weight Loss...A Collaborative Study Approach

A new study being led by Dr. Anthony Comuzzie, Scientist, and Dr. Michael Olivier, Chair, of Texas Biomed's Department of Genetics hopes to answer the question, "Why can some people lose weight and keep it off, while others lose it but then gain it back despite their best efforts?"

The study follows on efforts begun by TOPS (Take Off Pounds Sensibly), a nonprofit weight loss support organization, headquartered in Milwaukee, WI. TOPS supports research on obesity and has underway a large-scale genetics study, the Metabolic Risk Complications of Obesity (MRC-OB) Genes Study.

Olivier is one of the senior scientists on the MRC-OB study, which has led to the newly established TOPS Nutrition and Obesity Research Center in Texas Biomed's Department of Genetics.

Under Olivier's and Comuzzie's direction, the Center will focus on the contribution of genetic and lifestyle factors on the development of obesity and successful weight loss. Scientists have begun working with TOPS members in Texas who have successfully reached and maintained their target weight. A pilot effort to collect information and DNA from TOPS members and their families is being supported by a collaborative grant from the Institute for Medicine & Science at the



(Pictured left to right) Dr. Michael Olivier, Barbara Cady, president of TOPS Club, Inc. and Dr. Anthony Comuzzie

UT Health Science Center-San Antonio and the Texas Biomedical Forum.

"We hope to expand our efforts into a nationwide effort to assess eating habits and diet success," Comuzzie said. "We also aim to establish close relationships with TOPS Chapters here in Texas to assess nutritional, behavioral, socio-economic, genetic and other environmental contributions to obesity and weight loss."

"We have to take into account all of these factors over a long period of time," Olivier said. "There are no shortcuts."

The Search for Aging Well

One good thing often leads to another. That's the case with Dr. Suzette Tardif's involvement in groundbreaking research which reported in 2009 that Rapamycin was the first, and still only, pharmaceutical intervention to reliably increase lifespan in a rodent model. That finding generated world-wide interest and was named by Science as one of the Top Ten scientific discoveries of 2009.

Now, Dr. Tardif, who is Associate Director of Research at Texas Biomed's Southwest National Primate Research Center and Co-Leader of the Regenerative Medicine and Aging Scientific Unit, is serving as Co-Investigator on a new grant from the National Institute on Aging which will study both the healthspan and lifespan effect of Rapamycin on middle-aged marmosets at SNPRC. Principal Investigator is Dr. Adam Salmon of the Barshop Institute for Longevity and Aging Studies at the University of Texas Health Science Center in San Antonio.

"The new grant, awarded this July, will make possible an extended, five-year study on the lifespan effects of Rapamycin on some 80 marmosets that have already reached middle age," Dr. Tardif said. "Marmosets are the perfect primate for this next-phase research since they have a lifespan of about 20 years, which will make the results of a five-year study beginning at their middle age very significant. We are now identifying those animals in SNPRC's marmoset colony for the study and they will begin receiving Rapamycin in approximately February of 2016."



Dr. Tardif and colleagues completed a pilot project in 2012 that focused primarily on the safety of encapsulated Rapamycin. Those studies, which were published late last year and early this year showed the marmosets tolerated Rapamycin well and showed no signs of metabolic dysfunction, which was a concern.

She added, "This study will be a vital next step in understanding and evaluating Rapamycin's long-term effect on a primate in order to make determinations about possible use in humans."

"When you are talking about the possibility of increasing not only the length of life but also the quality of life, you must be very careful in every phase of such research," Dr. Tardif said. "What looks very promising in a rodent study must translate into a primate study and that necessarily takes more time and is more complicated. I've been fortunate to participate in this research from the beginning, and all of us go into this new study with a lot of anticipation."



New scientist joins the fight against HIV with a genetic approach



Texas Biomed is excited to welcome Dr. Smita Kulkarni to the team in April 2016. She has accepted a joint position as Assistant Scientist in the Department of Genetics and Virology and Immunology, where

she will study the genetic factors influencing HIV infection. Dr. Kulkarni is currently an instructor at the Ragon Institute of MGH (Massachusetts General Hospital), MIT and Harvard in Cambridge, MA.

Complementing the work being done by Texas Biomed's AIDS Research Program, Dr. Kulkarni's primary research has investigated genes involved in regulating the immune system. She studies molecules critical to the development of both innate and adaptive immune responses. Innate cells

recognize a virus immediately while adaptive cells are more specialized and provide for a more long-term response to a virus. She aims to understand how regulation of immune genes modifies susceptibility to HIV and other diseases with the objective of discovering therapeutic targets.

Dr. Kulkarni obtained her Ph.D at the Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) in India. She completed her post-doctoral fellowship at the National Cancer Institute in Frederick, MD. She is a 2013 recipient of the Ragon Innovation Award, Center for AIDS research (CFAR) scholar award (2015), an NIAID exploratory/developmental research grant award (R21, 2015) and is a member of both the American Society for Human Genetics and American Association of Immunologists.

Her recruitment was funded by a grant from the Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation of San Antonio.