

OCTOBER | 2014

# TGen Today

A PUBLICATION OF THE TRANSLATIONAL GENOMICS RESEARCH INSTITUTE



## THE DRUMS OF HOPE

A Daughter's Wish Yields Cause  
of Rare Ovarian Cancer



A Non-Profit Biomedical  
Research Institute



Left to Right: Terry Lee, Dean Ballard, Merrill Hoge, Bennett Dorrance, Dan Arment



Karen and Bob Hobbs



Kim Holleran and Patti Gentry



Dr. Jeffrey M. Trent and Karl Eller

# PHILANTHROPY IN

Over the past decade, the steady decline in federal funding for biomedical research has led to an increased need for philanthropic support. Today, much of TGen's research is supported by the generosity of caring philanthropists, all of whom share our passion for accelerating breakthroughs in a number of today's leading diseases and disorders.

In an effort to further broaden the scope of community support, former U.S. Vice President Dan Quayle, a recently elected TGen Foundation Board member, proposed developing

a series of "living room caucuses" to provide avenues of education, understanding and involvement in TGen's key research initiatives.

"These intimate gatherings provide a warm and wonderful way to bring friends into the TGen family," said TGen Foundation President Michael Bassoff. "We are privileged and grateful to the hosts of these events for opening their homes and offering their network of relationships to help raise critically needed funding for TGen's important research."



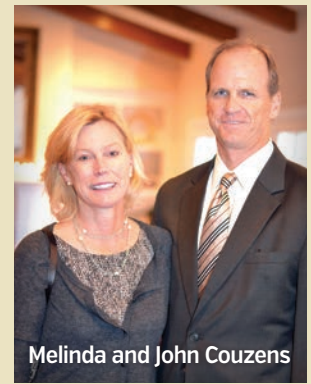
Darryl and Corinne Berger



Dan Quayle



Julie and Bill Lavidge



Melinda and John Couzens



Sharon Dupont-McCord



Andre and Subyn Wadsworth



Jacque and Bennett Dorrance



Blair and Bubba Moffett

# MOTION **LIVING ROOM CAUCUSES CONNECT DONORS WITH CAUSES**

The first caucus took place in early 2014 at the home of Darryl and Corinne Berger and benefitted TGen's Center for Rare Childhood Disorders. The Berger gathering included Vice President Quayle, as well as Bennett and Jacque Dorrance, whose long-standing commitment to supporting TGen includes establishing a federally certified laboratory at TGen to analyze patient genomes in support of clinical decisions.

A second event, hosted at the home of Bob and Karen Hobbs – the historic homestead of the late U.S. Sen. Barry Goldwater – centered on TGen's sports-related concussion research with

sports-equipment industry leader Riddell, the Arizona State University football team, Barrow Neurological Institute, and A.T. Still University. Guests included sports stars Merrill Hoge, former running back for the Pittsburgh Steelers; Kevin Young, former first baseman for the Pittsburgh Pirates and Kansas City Royals; and Andre Wadsworth, former defensive end for the Arizona Cardinals.

More caucuses are planned in the future. To host a caucus, please contact the TGen Foundation at 602-343-8411.



# D-Backs Come Out Swinging *In Support of Cancer Research*

America's legendary pastime unites a community in ways few sports can, and few teams in Major League Baseball (MLB) do more for their community than the Arizona Diamondbacks.

Through MLB's involvement with Stand Up To Cancer (SU2C), the D-backs highlighted the work of TGen's SU2C-MRA Melanoma Dream Team twice this summer in pre-game ceremonies at Chase Field.

In collaboration with the Barbara Ann Karmanos Cancer Institute and funded by SU2C and the Melanoma Research Alliance (MRA), the TGen-Karmanos led Dream Team is pursuing new therapies targeting a type of melanoma – BRAF wild-type– for which few exist.

On May 17, just before the start of the D-backs-Dodgers game, Diamondback's President and CEO, Derrick Hall, welcomed TGen President Dr. Jeffrey Trent onto the field before a crowd of more than

36,000 to present him with a check for \$25,000. The pre-game ceremony was part of the D-backs' recognition of May as Melanoma Awareness Month.

"It is my distinct honor to recognize the incredible work being conducted here in Arizona at TGen, and specifically recognize the accomplishments of our native son, Dr. Jeffrey Trent," Hall said. "We are incredibly blessed to have the highest caliber researchers at TGen, working to unlock the secrets of melanoma, and perhaps one day find a cure to this, the most deadly form of skin cancer."

## **TGen Takes the Field**

Less than a month later, on June 8, the D-backs once again highlighted the Melanoma Dream Team as part of Major League Baseball's skin cancer awareness day. Joining Dr. Trent on the field that afternoon were numerous members of the TGen Dream Team staff,



Dr. Jeffrey M. Trent, Tracy Bame with Bronson Arroyo

their families, and a special guest - SU2C patient advocate Tracy Bame - who threw out the ceremonial first pitch. Bame is President of the Freeport-McMoRan Copper & Gold Foundation.

For Bame, participating as an SU2C advocate is extremely meaningful because her father passed away nearly 20 years ago from this disease. Her family's experience in navigating potential treatments, and understanding the possibilities of success, she said, can help other patients and their families "holistically."

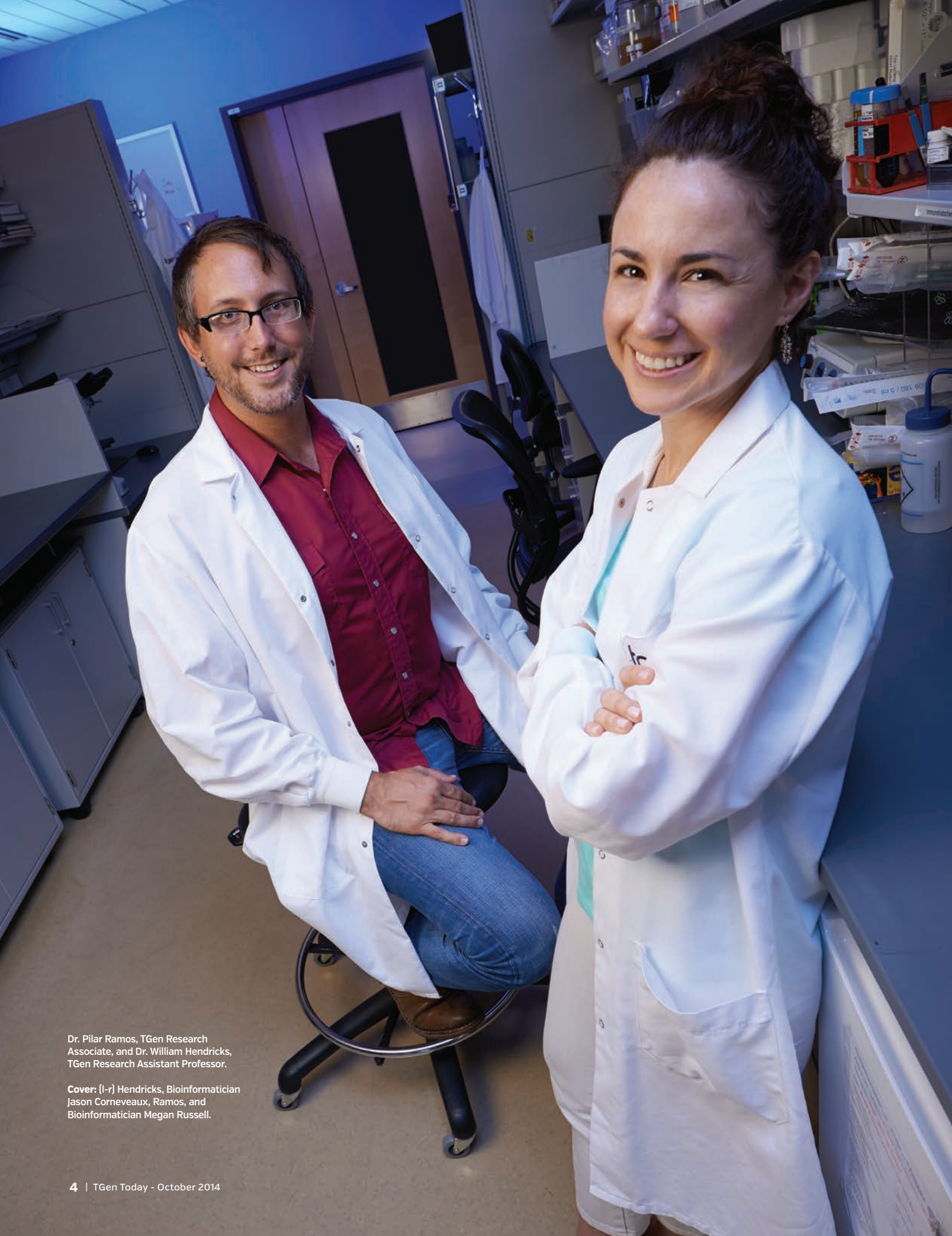
"It's gratifying not only to learn about and share the advances being made, but to be a voice in the process for patients in a clinical trial that may provide a better treatment and prognosis for this devastating disease," Bame said. "The brilliant physicians, medical professionals and scientists on the team are working so tirelessly to find a life-saving treatment for melanoma patients. By understanding the toll this disease takes, it's my honor to be part of the team and to try to see each case through the eyes of the patient and their family – from what questions they might

have, to how they may be affected by a course of treatment, to how long the treatment might take to produce a result. My goal is to think of the patient from an emotional and mental point of view, which is a very meaningful experience."

On average, 1-in-5 Americans will get some form of skin cancer in their lifetime. Sadly, 76,000 receive a diagnosis of melanoma annually, while nearly 10,000 individuals succumb to their disease. The Dream Team trials, expected to begin soon at Scottsdale Healthcare and at Mayo Clinic-Arizona, hope to close strong and add another win in the real-life challenge of science vs. cancer.

"TGen is grateful to the Diamondbacks and Major League Baseball for their ongoing support of SU2C/MRA and for bringing awareness to melanoma research," said Dr. Trent. "Our Melanoma Dream Team is accelerating research into how we can match the right drug to the right patient by close examination of an individual patient's DNA. Importantly, our FDA approved SU2C melanoma clinical trial is about to open, proving once again that local research benefits local patients first."





Dr. Pilar Ramos, TGen Research Associate, and Dr. William Hendricks, TGen Research Assistant Professor.

Cover: (l-r) Hendricks, Bioinformatician Jason Corneveaux, Ramos, and Bioinformatician Megan Russell.

# The Drums of Hope

## A Daughter's Wish Yields Cause of Rare Ovarian Cancer

"They have found something," Judy Jost said. "I can tell they're very excited about it. And I know it's important – researchers don't get that excited very often," said the Cave Creek, Arizona, resident who is an ardent supporter of TGen's ovarian cancer research.

Jost's enthusiasm is personal. In 2006 doctors diagnosed her 21-year-old daughter, Taryn Ritchey, with small cell carcinoma of the ovary, hypercalcemic type, also known as SCCOHT.

Ovarian cancer, in general, is the 5th leading cause of cancer death among women of all ages in the U.S. SCCOHT, an extremely rare and little-understood form of ovarian cancer, most often strikes girls and young women and typically goes undiagnosed until its advanced stages. Few survive it.

Taryn's cancer was advanced. She eagerly underwent a variety of treatments, but the spirited young woman who wanted to train as a crime scene investigator died at age 22. Earlier, with hopes of preventing other young women from repeating her struggle, Taryn asked her family to donate her tumor tissues to TGen for use in research.

"The researchers said there was only a five percent chance of getting anything out of it [finding cells appropriate for study], but they did," Jost recalled.

Taryn's hopes and TGen's research were bolstered in 2007 by a \$250,000 grant in Taryn's honor from mutual fund manager Foster Friess and his wife Lynn, of Scottsdale and Jackson Hole, Wyoming. Jost is Friess's executive assistant.

Taryn's rare cells became the first SCCOHT cell line TGen would study. And now, as Jost sensed, they have yielded some very important discoveries.

### Answers Reveled

This year, an international TGen-led team published groundbreaking findings that provided a giant step toward understanding SCCOHT. As a result, a simple new test to diagnose SCCOHT is now in use; further studies of the tumor cell's biology and possible new treatments are getting underway; and a fundraising initiative is being launched to support the new studies.

What the researchers discovered was nothing less than a bombshell: they discovered the root genetic cause of SCCOHT.

"We set out to uncover any small sliver of hope for women afflicted with this rare cancer. What we found instead are the nearly universal underpinnings of SCCOHT," said Pilar Ramos, a TGen Research Associate, and the study's lead author.

The culprit is a gene mutation found in the overwhelming majority of patients with the rare cancer. The finding sets the stage for developing a diagnostic test to identify SCCOHT at an earlier stage, and presents promising new directions for treating SCCOHT and possibly more common cancers.

"The genetic change identified occurs on a gene that is part of a protein complex that plays a role in many different cancers. The value of understanding how this change drives tumor development will likely extend beyond this rare cancer," said TGen's President and Research Director Dr. Jeffrey Trent, and the study's senior author.

Published in the top-ranked genomics journal, *Nature Genetics*, the TGen-led study included collaborators from Scottsdale Healthcare, Mayo Clinic, Johns Hopkins University, St. Joseph's Hospital and Medical Center, Evergreen Hematology and



Taryn Ritchey's rare cells became the first SCCOHT cell line TGen would study.

"The value of understanding how this genetic change drives tumor development will likely extend beyond small cell carcinoma of the ovary to provide insight into the role it plays in many different cancers."

Oncology, Children's Hospital of Alabama, the Autonomous University of Barcelona, British Columbia Cancer Agency, University of British Columbia, and the University Health Network-Toronto.

## The Science Behind the Finding

Genetic sequencing began after researchers collected as many tumor samples as possible, 17 in all.

"So little has been known about this disease. When we don't have a clue, we sequence a tumor's DNA and the patient's normal DNA and compare. We look for any genetic changes occurring in the tumor that are not in the patient's normal DNA," said Ramos, for whom the study also served as a doctoral thesis in Molecular and Cellular Biology at Arizona State University [see story below].

Sequencing guided researchers to a protein called SMARCA4 and the strange mutation that leads to the disease. In tumor tissues, SMARCA4 consistently had vanished, suggesting that in healthy cells its presence prevents tumor growth. No other mutations were evident. Because the SMARCA4 mutation was virtually never found

in cells from other types of ovarian cancer, the absence of SMARCA4 now can be used as a diagnostic test for SCCOHT, Ramos said. SMARCA4 earlier had been associated with lung, brain and pancreatic cancer, so it appears this discovery may have much broader implications.

"It's not uncommon to find things in rare cancers that are eye-opening in other more widespread cancers," Ramos said.

With the groundbreaking study come new scientific questions and the research required to answer them. New studies will investigate how the loss of SMARCA4 affects cells and identify new therapeutic targets and drugs, in addition to testing existing drugs as possible treatments.

"Primarily we are seeking a new strategy for treatment. We hope to find new standards of care," said Dr. William Hendricks, a TGen Research Assistant Professor and another author of the study, who is designing subsequent SCCOHT research to be conducted by the same team.

## The Way Forward

"It's been difficult to make reasonable scientific inquiries to understand the disease

(because it is so rare and variable), but now our conclusions can be based on reason," said Hendricks, commenting on the firm footing the findings provide for the next stage of research, which may be up and running within six months.

As always, research rides on dollars, and philanthropist Foster Friess again has stepped forward with a \$100,000 matching grant in honor of Taryn Ritchey.

"We have entered a new era in cancer research and treatment. As one who witnessed the ravages of this disease on an outstanding young woman, a cure will never come soon enough. But it is extremely heartening to see the progress TGen and its collaborators are making, and to know that I can help," said Friess, who was a friend and mentor to Taryn during her illness.

Taryn's mother shares Friess's enthusiasm.

"Taryn would be incredibly excited about the new research. I know they've got to do much more," said Jost, "but they are making great advances that are extremely encouraging for other young woman. I'll spend the rest of my life on this if I need to."

# AMBITION LEADS TO DOCTORATE

Dr. Pilar Ramos, lead author of TGen's groundbreaking ovarian cancer study, is an exemplar of Arizona's higher education system.

Ramos, 33, began her academic career at Glendale Community College, attracted by its biotechnology program. After graduating with a two-year degree, her credits all transferred to Arizona State University, where she earned a degree in molecular biology, leading to a job at TGen.

"I saw people there doing research all the time, and it inspired me. TGen has a tuition reimbursement program, so I went to graduate school and continued working fulltime," said Ramos, a native of Madrid, Spain.

At the completion of her graduate studies in 2014, she emerged with a Ph.D. in molecular and cellular biology, and a dissertation that announced a new hallmark in ovarian cancer research.

It wasn't a mere coincidence, according to Dr. Kenro Kusumi, the associate dean of ASU's College of Liberal Arts and Sciences and a mentor to Ramos.

"A major goal of ASU's Molecular and Cellular Biology Graduate Program is to produce the next generation of scientists who can solve medical

and biological problems. We intentionally revised our program with an interdisciplinary curriculum to work with Valley institutions. TGen is a unique, independent research institution with a mission that is complementary to that of ASU, which offers a Ph.D. education," said Kusumi, who earned his doctorate at Massachusetts Institute of Technology and is involved in genomic research with TGen.

"Research institutes like TGen are focused on the most challenging medical questions, and we very much value that partnership," Kusumi said.

Ramos found mentors on-the-job, starting with her former boss Dr. Heather Cunliffe and finishing with Dr. Jeffrey Trent, President and Research Director of TGen, in the final year of her studies.

"When Pilar applied for the program she struck me as incredibly bright and dedicated to cancer research," said Kusumi "And those are exactly the kind of traits you want in someone working in this area. I'll be keeping an eye on her. I'm sure she'll do wonderful things in her career."

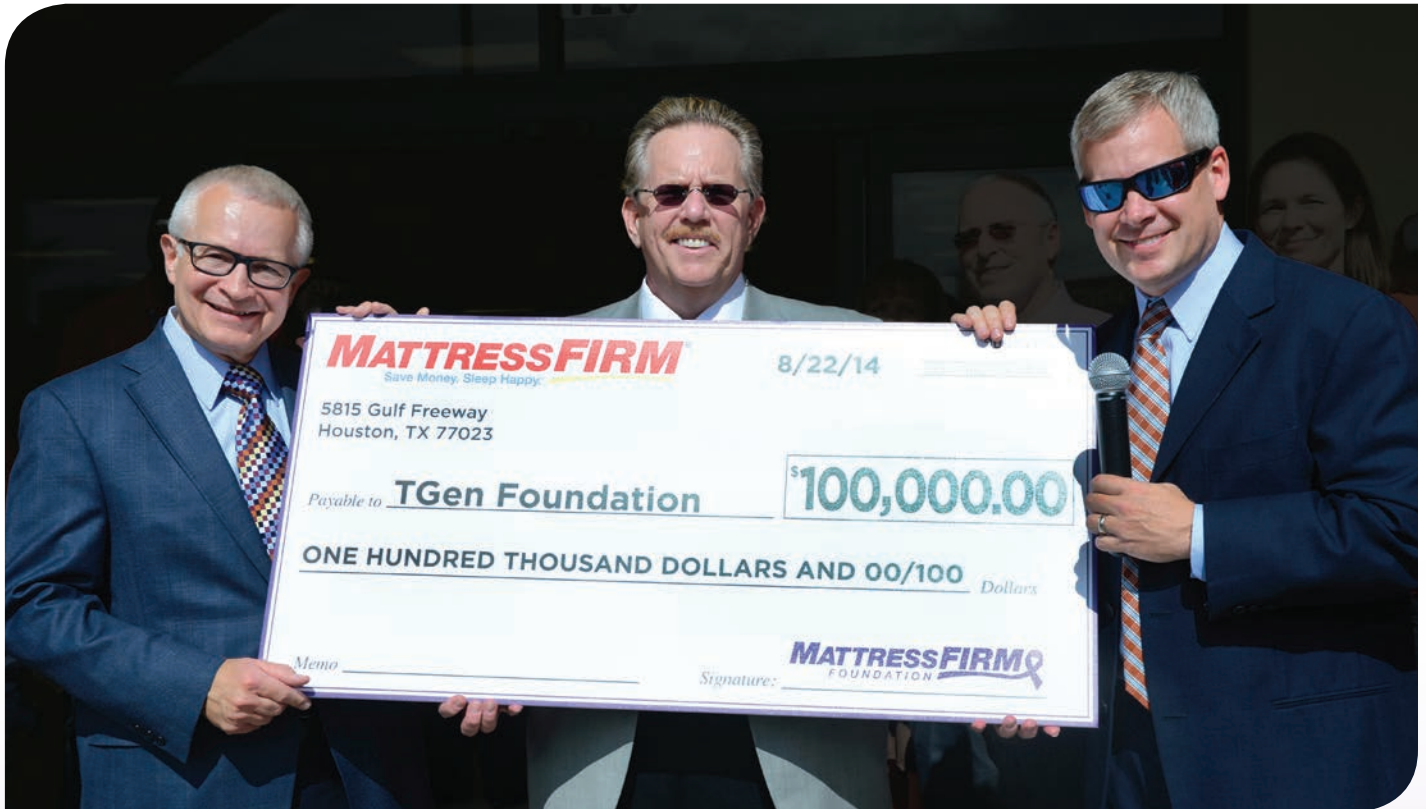
Never one to rest on her laurels, Ramos's plans are ambitious: "I want to find better treatments for ovarian cancer," Ramos said. "After that, other cancers."





# MATTRESS FIRM DONATES \$100,000 TO TGEN CANCER RESEARCH

Bedding giant leads TGen *stepNout* effort to find cure for pancreatic cancer



Mattress Firm, the nation's leading bedding retailer, recently donated \$100,000 for TGen's pancreatic cancer research.

The presentation was part of the opening ceremonies for Mattress Firm's 1,500th store, located in Scottsdale. The donation also establishes Mattress Firm as the presenting sponsor of TGen's 9th annual *stepNout Run/Walk/Dash*, a major fundraiser for TGen pancreatic cancer research.

"When Mattress Firm chose TGen as its charitable partner, we vowed to help create a world free of pancreatic cancer. Mattress Firm has since led and supported several major TGen fundraising initiatives, and we are proud to make a significant contribution to *stepNout*," said Steve Stagner, Mattress Firm President and CEO.

This year, *stepNout* takes place on Nov. 2 at the Scottsdale Sports Complex and will include a special message from this year's Honorary Chairman Derrick Hall, Arizona Diamondbacks President and CEO. More than 1,000 people are expected to participate in *stepNout*, which features fun, competitive races for all ages and abilities, including the event's signature 5K run.

"The people of Mattress Firm are truly committed to bringing hope and answers to patients and families facing pancreatic cancer," said TGen Foundation President Michael Bassoff. "Mattress Firm's sponsorship of *stepNout* will enable thousands of others to join in TGen's fight against this awful disease."

Vowing to "fight pancreatic cancer, one step at a time," *stepNout* aims to surpass the \$1 million mark in fundraising. Participants have donated more than \$750,000 since the event started in 2006.

## Join Us...

**What:** TGen's 9th annual *stepNout Run/Walk/Dash* for pancreatic cancer research.

**Where:** Scottsdale Sports Complex, 8081 E. Princess Drive, northeast of Hayden and Bell roads, between Loop 101 and Frank Lloyd Wright Boulevard.

**When:** 7-11 a.m. Sunday, Nov. 2.  
Registration starts at 7 a.m.; races begin at 9 a.m.; an awards ceremony is set for 10 a.m.; and a kids' dash is planned for 10:30 a.m.

**Cost:** Registration fees range from \$15 to \$35, depending on age and competition. Children ages 5 and under are free.

**Registration:** Register at the event, or register online by Oct. 28 by visiting [www.tgenfoundation.org/step](http://www.tgenfoundation.org/step).

**Parking:** Free.

**stepNout**  
RUN WALK DASH  
Presented by **MATTRESS FIRM**



## BARRETT-JACKSON

At Barrett-Jackson collector car auctions this year in Scottsdale and Palm Beach, autos sold on behalf of TGen generated a total of \$580,000. The cars auctioned for TGen included a 2013 Mustang RTR Spec 3 donated by Mothers Polishes-Waxes-Cleaners, and a 1979 Oldsmobile Cutlass Hurst Coupe donated by Ele Chesney, a family friend of auction CEO Craig Jackson. These funds benefit the Barrett-Jackson Cancer Research Fund at TGen.



## RUN FOR KIDS

More than 50 runners raised more than \$60,000 this year during the P.F. Chang's Rock and Roll Marathon through Phoenix, Tempe and Scottsdale in support of TGen's Center for Rare Childhood Disorders. This was the first time TGen was an official marathon charity.



## STEPNOUT RUN/WALK/DASH

More than 1,000 participants helped raise nearly \$133,000 at Tempe's Kiwanis Park during the 8th annual *stepNout Run/Walk/Dash* in support of TGen's pancreatic cancer research. The 9th annual *stepNout* will be Nov. 2 at the Scottsdale Sports Complex, northeast of Bell and Hayden roads.

## Upcoming TGen Fundraising Events:



**Sept. 23, 2014** – Howard Young's 5th annual *Atlanta Golf Classic* (Alpharetta, Ga.) for pancreatic cancer research.

**Sept. 28, 2014** – *Purple Pansies Gala & Wine Dinner* (Alpharetta, Ga.) for pancreatic cancer research.

**Sept. 28, 2014** – *United We Dance to Cure Cancer – Zumbathon* (Phoenix) for cancer research.

**Oct. 16, 2014** – *Guys Night Out* (Phoenix) for prostate cancer research.

**Oct. 17, 2014** – 16th Annual *Key to Cure* (Phoenix) for women's cancers research.

**Oct. 26, 2014** – *Tour de TGen* (Phoenix).

**Nov. 2, 2014** – 9th Annual *stepNout Run/Walk/Dash* (Scottsdale) for pancreatic cancer research.

# PENNY WAR BOOSTS CHILDREN'S RESEARCH

Children in Arizona's White Mountain communities, aided by local businesses, showed a little can go a long way this spring by waging a "Penny War," raising more than \$12,000 to fight rare disorders that affect some of their classmates at Blue Ridge School in Pinetop/Lakeside.

Organized by the non-profit Belnap Foundation for Mitochondrial Disease, the April-May events support the work of TGen's Center for Rare Childhood Disorders.

"A penny isn't worth much on its own. But when 700 students and several local businesses all come together for children with rare diseases, the pennies add up quickly and put us one step closer to answers," said Newell Belnap, who with his wife, Becky, started The Belnap Foundation after three of their four children were affected by mitochondrial disease, which affects the mitochondria, or powerhouse, of our body's cells.

"Our Penny War turned from a local school fundraiser for rare diseases into a community event with more than 25 businesses contributing to our cause," Belnap added. "In the end, we not only raise funds for much needed research, we also help raise the public consciousness about all the kids who need our help."

Blue Ridge students filled jars with pennies in a weeklong effort that included pizza parties, dodge-ball events, and iPod day. In addition to the Belnap children, some of their classmates have Leigh's disease, Cystic Fibrosis, Turner's syndrome, while others struggle with disorders still undiagnosed.

Penny War donations may still be made at:  
<http://mitochondrialdiseases.org/pennywar/>  
or [www.helptgen.org/raredisease](http://www.helptgen.org/raredisease).

*Proceeds will go to TGen's Center for Rare Childhood Disorders and the Foundation for Mitochondrial Medicine, which are both dedicated to diagnosing and finding new treatments for patients with rare diseases.*





Co-Chairs Robyn DeBell and Vicki Vaughn

# ‘CYCLE FOR THE CURE’ RAISES \$154,000

## Volunteers Propel Event’s Extraordinary Success



Committed community volunteers – caring individuals who are passionate about helping patients – are the cornerstones of TGen’s successful fundraisers.

One of the best recent examples is the 4th annual *Cycle for the Cure*, in which more than 200 indoor cyclists at all the Village Health Clubs and Studio 360 helped raise nearly \$154,000 for cancer research at TGen.

“The incredible success of the *Cycle for the Cure* event can be traced to this group of visionary community leaders and businesses who want to help TGen find better ways to treat and accurately diagnose cancer,” said TGen Foundation President Michael Bassoff. “The energy generated by these extraordinary community volunteers is just remarkable, and we sincerely appreciate their energy, enthusiasm and generous financial support.”

Spurred by dynamic music and motivational instructors, the heart-pumping, 2-hour cycling event sold out all bike slots at all four locations, surpassing this year’s \$125,000 goal by nearly 20 percent, and continuing *Cycle*’s exponential rise in funding and participation year-over-year.

“This year’s *Cycle for the Cure* far exceeded our expectations. The fun and the enthusiasm with the event were contagious. Now, more and more people are aware of how TGen benefits cancer patients,” said event Co-Chairs Robyn DeBell and Vicki Vaughn. “We most sincerely thank the club management, the instructors and committee members donating their time to this event which further allows the scientific breakthroughs being made at TGen.”

TGen’s focus on developing and delivering precision medicine enables physicians to deliver care more effectively and efficiently. Using genomic sequencing, TGen helps doctors match the appropriate therapy to each patient’s DNA profile, producing the greatest patient benefit.

All of the funds generated by *Cycle for the Cure* support cancer research at TGen, and most of the patients who benefit from TGen’s research are Arizonans. The TGen Foundation already has plans for the 5th annual *Cycle for the Cure*. Mark your calendars for Sunday, May 3, 2015.



## A Pause for Celebration

### Dr. Daniel D. Von Hoff receives multiple awards and recognitions

Successes and achievements often define a career. And who better to recognize such milestones than one's peers? In recent months, Daniel D. Von Hoff, M.D., F.A.C.P., TGen's Distinguished Professor and Physician-in-Chief, was the recipient of three peer-driven accolades.

A medical oncologist and oncology drug developer whose major interest is in the development of new anticancer agents, Dr. Von Hoff's career spans almost four decades and shows no sign of slowing down.

His recent recognition includes:

- Being named one of the 50 Oncology Luminaries of the past half-century by the American Society of Clinical Oncology;
- Induction into the Joshua Lederberg Society, named for the late Dr. Joshua Lederberg, a Nobel Prize laureate and leader in bacterial genetics; and
- Recipient of a Hope Fund for Cancer Research Award of Excellence for his work in developing new drugs to treat patients with cancer, received in the company of Nobel Laureate Dr. James D. Watson, best known as the co-discoverer in 1953 of the double-helix structure of DNA.

"I have never been more excited about how the immediate application of the best science can rapidly benefit our patients," said Dr. Von Hoff, who has been instrumental in developing numerous new cancer treatments.

In addition to TGen, Dr. Von Hoff conducts his clinical research at Virginia G. Piper Cancer Center Clinical Trials at Scottsdale Healthcare, a partnership between Scottsdale Healthcare and TGen.