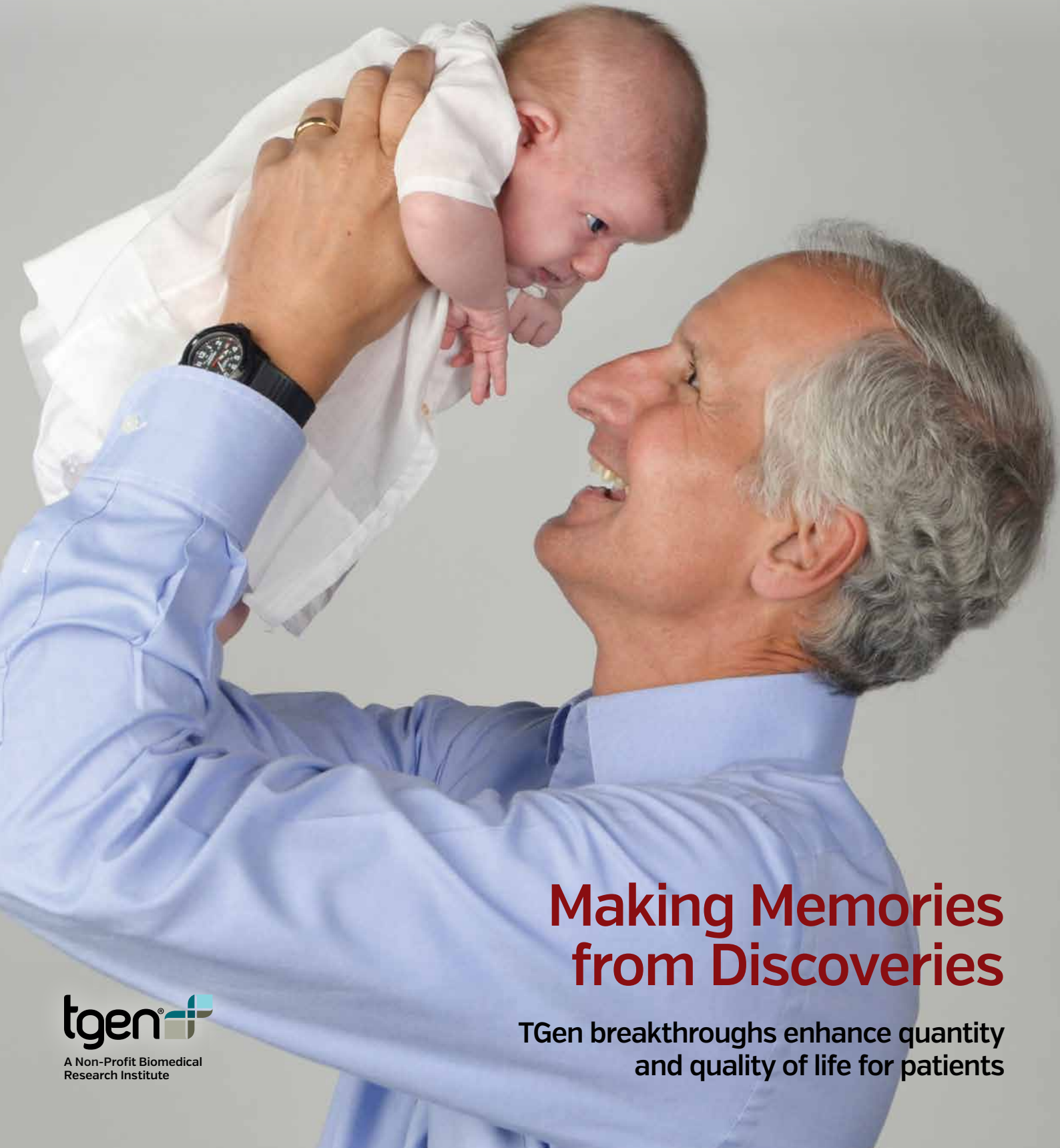


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TGen Today

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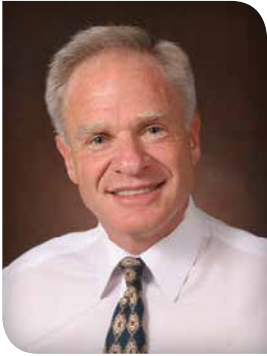


Making Memories from Discoveries

TGen breakthroughs enhance quantity
and quality of life for patients



A Non-Profit Biomedical
Research Institute



A Look Inside...

Dear Friends,

The birth of a granddaughter. A father-son trip. An encouraging word from a sports hero. The chance to make a difference in the world.

These are important memories for so many people, but for the patients you will meet in this edition of *TGen Today*, these are milestones that weren't supposed to be marked. Through the dedication of TGen's scientists and our physician-collaborators, patients facing cancer, rare diseases and neurological disorders have not only extended their *quantity* of life, but also their *quality* of life.

Now, through an alliance with the California-based City of Hope health system, TGen will extend its groundbreaking research and life-changing results to even more patients throughout the world. City of Hope brings more than a century of experience treating people with cancer, diabetes and other serious illnesses to this relationship, enabling TGen to expand its translational footprint and help more patients celebrate life's big and small achievements.

We invite you to celebrate this new chapter for TGen while also acknowledging our own milestones: A decade of biomedical success with the *Helios Scholars at TGen* summer internship program. A quartet of new diagnostic tests from TGen North that will deliver more accurate answers to physicians treating infectious disease. A new frontier in clinical trials to help pancreatic cancer patients.

We could not do this without your steadfast support and advocacy. We wish you a warm holiday season and a peaceful and prosperous new year.

With gratitude,

A handwritten signature in black ink that reads "Michael Bassoff". The signature is fluid and cursive, with the first name being particularly prominent.

Michael Bassoff
President, TGen Foundation



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World-renowned sarod maestro plays benefit concert for TGen

About TGen

The Translational Genomics Research Institute [TGen] is a non-profit organization dedicated to conducting ground breaking research with life changing results. Research at TGen is focused on helping patients with diseases such as cancer, neurological disorders and diabetes. TGen is on the cutting edge of translational research where investigators are able to unravel the genetic components of common and complex diseases. Working with collaborators in the scientific and medical communities, TGen is making a substantial contribution to the efficiency and effectiveness of the translational process. For more information, visit: www.tgen.org



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Howard Young and his daughter, Jana, take a helicopter ride. Howard is a 14-year pancreatic cancer survivor, thanks in part to treatments developed at TGen.

Time has
a way of
showing us
what really
matters.

Making Memories from Discoveries

Identifying new drug targets to beat back cancer and extend life, uncovering the genetic underpinnings of a rare disease, developing more accurate and faster ways to diagnose a constellation of symptoms: These are milestones that scientists at TGen strive to reach each day.

But they don't mean anything unless we can translate these discoveries into milestones that patients can celebrate: Another birthday. A family vacation. A visit with long-lost friends. These moments, large and small, give meaning to our work.

We invite you to meet some patients whose lives have been impacted by TGen's discoveries and reflect on the memories they have been able to create. Through your generous support of our research, you've helped to make memories possible for countless families like these.

“Every day is a blessing. If it’s raining... if it’s sunny... I am thankful. I thank God every morning and night.”

Howard Young

Howard Young has witnessed the graduations of all three of his daughters from high school and college. He’s walked two of them down the aisle at their weddings, and he’s hopeful about the prospects for a third.

He’s celebrated extra anniversaries with his wife Becky of 32 years.

A few months ago, he experienced the blessing and excitement of meeting Cecilia Cutino, his first grandchild. *[see Cover]*

“I got to come right in there and hold her,” Howard said from his home in Georgia. “There was a point in my life that I didn’t think I’d be able to see that. We’re a close family and we’ve walked this journey together. Every day is a blessing. If it’s raining... if it’s sunny... I am thankful. I thank God every morning and night.”

A 14-year pancreatic cancer survivor, Howard has navigated three recurrences with TGen’s Physician-in-Chief Dr. Daniel D. Von Hoff, whom he credits with saving his life.

Pancreatic cancer this year will take the lives of nearly 42,000 Americans, surpassing breast cancer to become the nation’s third-leading cause of cancer-related death. The 5-year survival rate is less than 10 percent.

When Howard first Googled his prognosis in 2002, the search engine served up a death sentence. Undeterred, he found TGen’s clinical trials, and in the process, Howard found a new purpose.

“I’m not a doctor, but I am a survivor, and I can give patients hope,” he said. “When you hear pancreatic cancer, your hope is challenged. You need to

be shored up and supported. Survivors can say things that others can’t, and I’m thankful to be given the opportunity.”

When he was diagnosed, friends, family, colleagues and acquaintances began contacting him to express their concern, share his fears, and mainly to tell him how much he meant to them. Hugs, notes, favors and meals poured forth.

His burly, old school barber even shut down his store to make a house call when Howard was too sick to come in for his haircut.

“You hear that old saying about ‘living like you’re dying,’” Howard recalled. “Well, you shouldn’t have to get cancer to tell someone how much they mean to you. We ought to live that way every day and tell people you love them and how much they mean to you.”

“She got stronger and stronger, and we just watched her flourish.”

Shelby Valint

Six years ago, Shelby Valint was a fifth grader who could barely hold her head up and had difficulty walking, talking and swallowing food. While her mind was bright, she needed a wheelchair to get around.

Since she was an infant, Shelby and her family had been on a decade-long search for a diagnosis. Shelby visited countless doctors and underwent numerous examinations and tests at medical facilities across the nation.

Eventually, Shelby wound up in the care of Dr. Vinodh Narayanan, who recommended that Shelby have her genome sequenced by TGen.

TGen’s analysis revealed a problem in a gene known as DDC, key to the production of dopamine, a brain chemical responsible for movement, muscle control and balance. In 2010, Shelby began taking drugs often prescribed for Parkinson’s disease, a disorder of the nervous system associated with diminished dopamine.

Within a few weeks, Shelby was stronger. She could hold her head up. Her speech was clearer. She started doing more things on her own. She was getting herself dressed. Soon, she no longer needed a wheelchair.

“It happened so quickly. It was amazing,” said her mother, Renee. “She got stronger and stronger, and we just watched her flourish.”

One day, Shelby took her mother’s hand, walked out the front door and walked down the street. “That’s when I thought, this is a miracle,” Renee said.

Soon, Shelby was walking to school. “I remember the first day she walked into school. The students and staff were crying. They had seen Shelby through the years in a wheelchair, and here she was on her own two feet,” her mother said.

After a time, she not only was walking, but also dancing.

Shelby’s success helped launch TGen’s Center for Rare Childhood Disorders



Shelby, who inspired the creation of TGen’s Center for Rare Childhood Disorders, now enjoys painting.

[C4RCD], where Dr. Narayanan is now Medical Director.

Today, Shelby continues to do well. She is 16 and she is as positive as ever. “Sometimes there are setbacks, but we get through them together. I just look at her and I’m amazed at how brave she is,” her mom said.

“I am doing great. I’ve been painting canvases everyday and getting so much better at my technique,” Shelby said. “I hope my paintings and my story inspire people everyday.”

Continued ▶

Donald and Chris Polityka

On Father's Day weekend 2010, Chris Polityka's Dad, Donald, received the news: Stage 4, inoperable pancreatic cancer.

"He was told to get his affairs in order," recalled Chris. "We had a summer trip planned for Vail, Colorado, and Mom thought we should cancel. Dad said, 'Heck no! I'm not canceling anything. This may be my last vacation!'"

When the family returned to Phoenix, Donald enrolled in a Stage 1-B clinical trial, led by TGen's Dr. Daniel Von Hoff. The trial combined gemcitabine and nab-paclitaxel for advanced-stage patients, which today is the gold standard for care.

"He was given a few months to live, and after a few weeks on that trial, things started looking more promising," Chris explained. "He ended up having two more years – and it was quality of life, not just quantity."

Donald, a retired Motorola executive and retired Air Force Reserve colonel, resumed his volunteer activities at Habitat for Humanity. He rejoined his softball team, and started playing racquetball again at the Village Club. Those two years enriched Chris's quality of life as well.



Troy poses with Eddie Van Halen's iconic "Frankenstrat" guitar.

Troy Richards

Troy Richards is one in million – initially for all the wrong reasons.

He was diagnosed in 1999 with adrenocortical carcinoma, a very rare

"Dad ended up having two more years – it was quality of life, not just quantity."

"I was busy in my career, but I made the time to be with him," said Chris, an only child. "We took a father-son trip like we had when I was in Boy Scouts. We went to Sedona and did some hiking. I made a disciplined effort to have those moments and share those memories and appreciate the time, space and place with him."

The family returned to Vail the following summer with Chris' now-husband Eric Thomson, and they broached the subject of white-water rafting. Chris' mother Barbara, did not want her husband of 49 years taking a chance.

"She said, 'You can't do this! You have cancer! And Dad just said, 'What does that have to do with anything?'" Chris recalled with a warm laugh. "No one fell out of the boat and we came back with all our limbs."

Chris' father passed away in January 2013. That December, he and Eric flew to New York to get married. He later quit his job in the corporate world to launch his own company in January 2015, a chef-inspired



Chris took a family trip with his father Don and mother Barbara to Colorado.

healthy eating service.

Chris counts the two years with his father as the inspiration for his life changes.

"I remember us sitting by Beaver Creek on a bench and talking about our challenges and joys and struggles, and suddenly being very aware that life is a gift," he said. "And it is precious, and we are living on borrowed time."

"Not a lot of people are told they have six months to live when they are 35 years old."

cancer that strikes one to two people per million each year.

"Not a lot of people are told they have six months to live when they are 35 years old," he said. "I was at my prime, building my business, and it opened my eyes. I can build wealth and do all this, but if I die in the process, it really doesn't mean anything."

He survived surgery to remove a football-sized tumor along with one kidney and adrenal gland. After a recurrence in his lung five years later, Troy emerged with two goals: Find a better way to treat his cancer and start a research project that could help people like him. Troy and his wife Katarina started the ATAC Research Fund at TGen, or Advancing Treatments for Adrenocortical Carcinoma.

"The only approved drug for adrenal cancer is a derivative of the pesticide DDT.

I didn't want to take that," he said. "There had to be a better way."

His oncologist in Tucson, Ariz., referred Troy to Dr. Daniel Von Hoff at TGen. Molecular profiling of Troy's tumor found a drug target similar to multiple myeloma. Surgery and a routine round of chemo followed. In 2014, it reappeared in his liver, and TGen sequencing revealed a target similar to a brain cancer drug. After additional surgery and chemo, he's cancer-free today.

"I never would have started a cancer research fund if I didn't have cancer," he said. "We've started big support groups, and we've changed the way adrenal cancer research is conducted. If anything, I'm grateful this allowed me to get involved with TGen. Our project at TGen has saved lives."

Campbell Faulkner

Before Campbell Faulkner's speech at TGen's Roaring for Research gala in February, his parents Shane and Carrie played rock-paper-scissors to see who would jump on stage if their 10-year-old son froze in front of 300 people.

Rock won, but neither parent had to come to the rescue.

"He was just a rock star. He rocked it!" Shane recalled. "And since then, he's done three more speeches and inspired countless others just by being able to get up there and talk."

Public speaking. Throwing out the first pitch at a Chicago Cubs spring training game. Befriending an Olympian: Campbell has accomplished more by age 10 than many would in a lifetime.

His matter-of-fact bravery in the face of continuous feeding tubes and the occasional need for a wheelchair so inspired Chicago Cubs outfielder Kyle Schwarber that the slugger wears a bright green Campbell's Crew bracelet every day. When he returned from a season-long injury to bat against the Cleveland Indians in the World Series, Schwarber credited Campbell for being his inspiration.

"He's just always got a big smile on his face," Schwarber told *Sports Illustrated*.



Chicago Cubs outfielder Kyle Schwarber wore his Campbell's Crew bracelet throughout the 2016 World Series.

"He's living life to his fullest, even though he's got something to overcome."

The youngest of four siblings, Campbell struggled all his life to put on weight. He tired easily and sometimes required supplemental oxygen.

On the day Campbell asked Santa Claus for a cure, TGen called to ask about testing his blood in hopes of finding a treatment at the Center for Rare Childhood Disorders in Phoenix.

Although diagnosed with Mitochondrial Disease – a group of disorders caused by dysfunctional mitochondria – TGen scientists continue work to pinpoint the

exact, genetic cause to provide his family a better understanding of his illness and a smarter treatment plan.

"He kept growing taller, but his body mass was declining," Shane explained. "It was getting to a critical point of what's next? What do we do to keep him going? The other doctors just wanted to manage his symptoms, but TGen has given us the hope of someday understanding what his condition will be."

In the meantime, Campbell continues to inspire: Olympic kayaker Mike Dawson could be seen wearing his green bracelet when he competed in Rio. Campbell gives the bright green gifts to everyone he meets, asking them for thoughts and prayers. This simple act has raised awareness about Mitochondrial Disease everywhere.

"One of the biggest gifts we've been given is that Campbell has been able to give back," said his mom Carrie. "For the first time in his life, he's stable. We're not adding any new meds. We're not changing anything. We just get to enjoy Campbell."

And Campbell just gets to enjoy life to the fullest.



Campbell became an advocate and went to 92.3 KTAR to record a radio spot with Karie Dozer for TGen's Center for Rare Childhood Disorders.

"He's just always got a big smile on his face."

TGen and City of Hope create alliance to advance precision medicine

Together, City of Hope and TGen will transform the diagnosis, treatment and prevention of cancer and other life-threatening diseases, accelerating research discoveries into cures for patients.

TGen partners with dozens of hospitals, universities, private industry and other research institutions around the globe to advance genomic-based medicine.

Perhaps no collaboration in TGen's 14-year history is more significant than its newly announced alliance with City of Hope.

For more than a century, City of Hope has served patients' medical needs through its main campus hospital in Duarte, northeast of Los Angeles, and 13 satellite facilities throughout Southern California, where it is a leader in the fields of cancer care, diabetes and other life-threatening diseases.

Now, TGen and City of Hope aim to make precision medicine a reality for more patients by accelerating genomic discoveries into clinical trials, advancing standards of care, and improving patient outcomes and quality of life.

The alliance enables both institutes to complement each other in their common areas of research and patient care, with City of Hope providing a significant clinical setting to advance scientific discoveries made by TGen.

"This alliance will enable us to fully deploy genomic-enabled medicine within

a modern healthcare system to create a disruptive change in the practice of medicine. Our aim is to not only navigate this changing field, but lead it," said Dr. Jeffrey Trent, TGen President and Research Director.

City of Hope is one of the nation's 47 comprehensive cancer centers, the highest recognition bestowed by the National Cancer Institute, and is ranked as one of "America's Best Hospitals" in cancer by *U.S. News & World Report*. TGen is a world leader in applying genomic analysis and bioinformatics to cancer drug development.

Together, City of Hope and TGen will transform the diagnosis, treatment and prevention of cancer and other life-threatening diseases, accelerating research discoveries into cures for patients. The alliance reinforces City of Hope as the destination for those with the most complex cancers, and will enhance City of Hope's ability to deliver targeted therapy to those with advanced cancer.

"Patients want choices and access to the newest and most advanced care available," said Robert W. Stone, President and Chief Executive Officer of City of Hope. "City of Hope and TGen share a common vision for improving patient outcomes, and our collaboration will speed cancer cures by rapidly advancing discoveries to define high-risk populations, identifying targets for



Dr. Steven T. Rosen, Provost and Chief Scientific Officer for City of Hope, and Daniel Von Hoff, M.D., F.A.C.P., TGen Physician in Chief and Distinguished Professor.



Robert W. Stone, President and Chief Executive Officer of City of Hope and Dr. Jeffrey Trent, TGen President and Research Director.

“This alliance will enable us to fully deploy genomic-enabled medicine within a modern healthcare system to create a disruptive change in the practice of medicine. Our aim is to not only navigate this changing field, but lead it.”

– Dr. Jeffrey Trent
TGen President and Research Director

prevention and treatment and promoting initiatives that close health equity gaps.”

Precision medicine is emerging as a primary approach for disease prevention and treatment for complex conditions. It is being explored for conditions such as cancer, diabetes and rare genetic diseases. The ability to better diagnose, treat, cure and prevent diseases depends on: discovering the genetic causes of diseases; understanding why individuals respond to different therapies; and translating this understanding into new diagnostic tests and therapies.

“Precision medicine is the future of cancer care,” said Dr. Steven T. Rosen, Provost and Chief Scientific Officer for City of Hope. “Together, City of Hope and TGen will cover the bench-to-bedside continuum. Our complementary strengths will propel us to the forefront

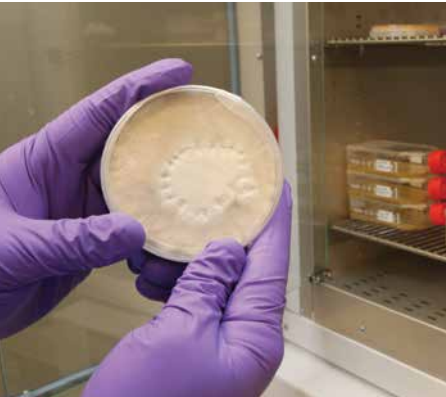
of personalized medicine in alignment with our nation’s ‘Moonshot’ initiative.”

In forming this alliance, City of Hope and TGen will focus on leveraging their respective strengths in patient care and genomics to develop a comprehensive *Personalized Hope* program to detect disease sooner, and improve patient quality of life and survival. Near term, they will focus on leveraging their respective strengths in immunotherapy and genomics to rapidly gain new insights into immune function and expand opportunities for the rational design of new immune interventions.

TGen remains an Arizona-based nonprofit with headquarters in Phoenix. As part of the agreement, TGen will join the City of Hope system by becoming a subsidiary of the City of Hope parent organization.

TGen North Disease Detectives

New generation of fast, accurate, low-cost tests will give patient's and physicians answers for Valley Fever, MRSA, Kleb



To the average passerby, the exterior of TGen North looks no different than any of the businesses it shares space alongside at Flagstaff Airpark, a collection of low-slung brick and glass structures that typify any business cluster scattered across small-town America. Located adjacent to I-17 among towering Ponderosa Pines on the outskirts of Flagstaff, Arizona – population 70,320 – what separates TGen North from its neighbors is the work conducted by the scientists within the biomedical laboratories at TGen's northern outpost, home to its Pathogen Genomics Division.

On any given day the faculty, led by noted pathogen expert Dr. Paul Keim, are busy developing genomic-based tests to rapidly, accurately and inexpensively detect any number of debilitating – and potentially lethal – infections that affect hundreds of thousands of patients annually. Over the past several years they've made great strides toward developing tests for Valley Fever, Lyme disease, antibiotic-resistant *Staph* and *Klebsiella* infections.

"Providing physicians and other medical professionals with the kind of exacting diagnostics that we are developing today has the potential to save thousands of lives and billions of dollars in our nation's healthcare system," said Dr. Paul Keim, Professor and Director of TGen North.

Current tests for fungal-caused Valley Fever, or bacteria-caused Lyme disease, are highly inaccurate, costly and time-consuming, requiring nearly a month in some cases to grow petri-dish cultures of suspected pathogens in a laboratory.

Hospitals and clinics worldwide are facing growing threats from healthcare-borne infections such as *Staphylococcus aureus* and *Klebsiella pneumoniae*. This is especially true of antibiotic-resistant strains of these bacteria, for which the current medical arsenal of antibiotic drugs are increasingly ineffective.

"The most accurate and more informative approach to take for infectious disease diagnostics is to target the pathogen's specific

DNA, and that has been our approach with these new tests," said Dr. David Engelthaler, Director of Programs and Operations at TGen North.

Implementation of TGen's genetic-based tests are all a step closer this year.

In June, the Australian government issued TGen and Northern Arizona University (NAU) the first of many expected international patents for the rapid detection of MRSA, methicillin-resistant *Staphylococcus aureus* – an antibiotic-resistant form of the Staph bacteria that annually kills more Americans than HIV. Other countries include the U.S., Canada, European Union, Japan, and Brazil, to name a few.

In August, the U.S. Patent and Trademark Office issued a patent to TGen and NAU for a rapid diagnostic test for Valley Fever. DxNA LLC, a company based in St. George, Utah, has licensed both test technologies to market to hospitals and clinics.

In September, the *Journal of Clinical Microbiology* published a paper describing the many advantages of TGen's KlebSeq test for *Klebsiella pneumoniae* and other hospital-acquired infections (HAIs), which affect hundreds of thousands of patients annually and add nearly \$10 billion in associated healthcare costs.

"Improved testing technology holds great potential for the rapid detection of HAIs and more quickly identifying antibiotic-resistant infections, which have become an urgent public health crisis," said Dr. Jolene Bowers, a Post-Doctoral fellow at TGen North and the study's lead author. "KlebSeq is a perfect example of the power of genomic-based analytical tools that deliver results faster, more accurately and at a lower cost."

Meantime, TGen North faculty continue work on the LymeSeq test for detecting Lyme disease, another pathogen-caused infection that is often misdiagnosed and whose proper treatment is often delayed.



TGen-NAU Anthrax Study Solves Cold War Mystery

A study by TGen and Northern Arizona University [NAU] used deep DNA sequencing methods to generate the anthrax genome sequence from the victims of the 1979 anthrax outbreak in Sverdlovsk, Russia, when it was part of the USSR.

The Soviet Union produced anthrax spores on an industrial scale but repeatedly denied the existence of their biological weapons program.

The study, published in the September issue of the journal *mBio*, represents a precise and detailed examination of the anthrax strain used in the former Soviet Union's weapons development, and includes an anthrax genetic database that puts the weapons strain into a global context.

"I have been studying this anthrax outbreak and these specimens for more than 20 years. Finally, using genomic technology, we could comprehensively characterize this pathogen genome," said Dr. Paul Keim, Director of TGen's Pathogen Genomics Division, a Regents Professor of Biology and the Cowden Endowed Chair of Microbiology at NAU, and the study's lead author.

"This is the signature agent of the world's largest biological weapons program and now we have it in our genetic databases. Anywhere this strain shows up again, we will be able to identify it and track it back to its source. This is now an essential part of our forensic arsenal," said Dr. Keim, who also is Director of NAU's Microbial Genetics & Genomics Center [MGGen].

The anthrax bacterium produces small capsules, or spores, that can lie dormant for decades. After settling inside the human lung, it can cause a severe disease that, if not treated with antibiotics, kills 90 percent of those it infects.

The Sverdlovsk anthrax outbreak was due to a faulty filter at a Soviet spore production facility, which allowed anthrax spores, in a silent plume, to drift with the wind over the city and into the nearby countryside. Nearly 70 Sverdlovsk inhabitants died as far as three miles downwind from the facility. It remains the world's deadliest human outbreak of inhalation anthrax.

This study was supported by a grant from the U.S. Department of Homeland Security.

“THERE IS A REASON FOR HOPE”

Pancreatic cancer patient seeks out TGen for a better chance at survival

“I have now survived for more than two years and I’m looking forward to many years to come.”

By the time Phil Zeblisky received his diagnosis of pancreatic cancer in May 2014, like so many others hearing the same news, his disease was already well down the road – Stage IV.

And like so many others, by the time his symptoms presented, his tumor had metastasized, ruling out the possibility of surgical removal, which is key to long-term survival.

Zeblisky realized he was in a life-threatening situation. Most of those diagnosed with advanced-stage pancreatic cancer succumb to their disease within a year.

But Phil was lucky.

“My wife, Kathy, is a medical librarian,” he said. “Through her research, her friends and colleagues, we learned of a clinical trial supervised by TGen’s Dr. Daniel Von Hoff.”

TGen’s Physician-In-Chief, Dr. Von Hoff has developed an international reputation for treatment of pancreatic cancer, in particular his innovative clinical trials and groundbreaking research. The work of Dr. Von Hoff and his colleagues most recently led to FDA approval of what is now the nation’s standard-of-care treatment for advanced pancreatic cancer – a combination of gemcitabine and nab-paclitaxel.

Buoyed by hope, Zeblisky entered a clinical trial that took that existing combination and added platinum-based

cisplatin, creating a regimen Dr.

Von Hoff dubbed the TGen Triple.

“I was all in,” Zeblisky said,

“And the results have been beyond our expectations: I am now a greater than two year survivor. My most recent scans showed no evidence of disease. I’m looking forward to many years to come. Kathy and I were even able to celebrate our 35th wedding anniversary recently, one of the greatest days of our lives, and something that was in doubt not all that long ago.”

Most recently, Dr. Von Hoff has designed and initiated a new clinical trial called the Grand Slam, which combines those drugs found in the TGen Triple with two additional elements: a special type of vitamin D, and an immunotherapy drug that uncloaks the cancer and allows patients’ own immune systems to attack the tumor.

“I really think that there’s a reason for hope now – hope that did not exist for pancreatic cancer patients in the past,” Zeblisky said. “Thanks in large part to the work of Dr. Von Hoff and TGen, there has been real progress, and patients like me are living longer.

His treatments shrunk his tumor and eliminated the metastasis enough that Zeblisky was able to have what remained of his tumor surgically removed in February 2016.

“Removal of a tumor after a patient is diagnosed with stage IV disease was virtually unheard of until these recent breakthroughs in treatment,” he said. “I’m now going through another round of chemotherapy. But at this point, I’m looking forward to longer-term remission. I even have a chance at a cure.”

Events raise more than \$1 million for TGen pancreatic cancer research

Phil and Kathy traveled to Boston in August to attend the 14th annual Seena Magowitz Golf Classic, which supports TGen. This year, the Seena Magowitz Foundation’s annual event raised \$747,000, according to foundation President Roger E. Magowitz.

The Seena Magowitz Foundation raised an additional \$205,000 for TGen pancreatic cancer research in September at the 7th annual Atlanta Golf Classic, organized by 14-year pancreatic cancer survivor Howard Young, a Board Member of the TGen Foundation, and chair of its National Pancreatic Cancer Committee.

“I now have a new lease on life, thanks to Dr. Von Hoff and TGen,” said Zeblisky.



HELIOS SCHOLARS AT TGEN TENTH ANNIVERSARY

Celebrating Ten Years of Biomedical Success



The event was held at the Arizona Biltmore to celebrate the 10th year of the internship program.

In late September, nearly 200 of the Valley's leading business and community leaders gathered at the Arizona Biltmore to join TGen and the Helios Education Foundation to celebrate the 10th year of their premier internship program, Helios Scholars at TGen.

Among the students highlighted was Sandra Gonzalez, the daughter of a single mother who migrated to America when Sandra was just six years old. She became the first in her family to graduate from high school and the first to attend college.

Today, Sandra is a doctoral candidate in bioengineering at Georgia Institute of Technology and Emory University, where she works with genes and cells in an attempt to develop a "biological pacemaker" for heart patients.

"My mother instilled in me the value of hard work and encouraged me to pursue my dreams and all this country has to offer," said Sandra, a Helios Scholars at TGen alumna from the Class of 2014. "One day I hope to become a professor at a university in Arizona and have my own laboratory and be a mentor like I had at TGen."

Sandra was one of five former students honored with the Outstanding Alumni Award at the Helios Scholars at TGen 10th Anniversary Breakfast in September.

The event capped a yearlong celebration of TGen's flagship summer internship program that provides hands-on training for the next generation of bioscience leaders under the mentorship of TGen faculty and staff. More than 400 Arizona students have graduated from Helios Scholars at TGen. According to a retrospective alumni survey, 55 percent work in fields related to their internship.

"We are proud of the impact Helios Scholars at TGen has had on the lives of hundreds of talented students in Arizona," said Paul J. Luna, President and CEO, Helios Education Foundation. "This program

provides a diverse student population with a unique opportunity to immerse themselves in an intensive, hands-on, scientific learning experience, and it propels them toward achieving success in college and career. We look forward to the next 10 years, and beyond, of this impactful program."

Among them is Dr. Elizabeth Hutchins, a post-doctoral fellow studying circular RNA in Dr. Kendall Van Keuren-Jensen's laboratory at TGen. A member of Helios Scholars Class of 2009, Elizabeth credits her internship with confirming her decision to pursue a career in genetics.

"That put the bug in me to pursue genomics," she said. "When I was trying to decide what to do for grad school, I knew I wanted to have that translational aspect that could benefit patients."

In May, Elizabeth was the co-lead author on a scientific paper published in *BMC Genomics* that identified three microRNAs associated with the regeneration of the tails in green anole lizards. The team of Arizona State University and TGen scientists hopes the discovery will lead to techniques to regenerate damaged tissue in humans.

Elizabeth is not an outlier with her publication: 46 percent of Helios Scholars alumni are published authors on a scientific manuscript.

Dr. Daniel Hannon, an internal medicine resident at Banner University Medical Center in Phoenix, discovered his career path as he was undergoing treatment for brain cancer as a 21-year-old student at Grand Canyon University.

"My eyes were opened to the world of medicine, and I knew I wanted to be a part of that," said Daniel, Class of 2011, and a recipient of the Outstanding Alumni Award. "The support, encouragement and mentorship I received at TGen allowed me to grow and develop confidence in myself that has continued to help me through medical school and now residency."



Dr. Jeffrey Trent and Paul Luna of the Helios Education Foundation.



Vince Roig, Founding Chairman of the Board, Helios Education Foundation.



[Left to right] Alumni: Giresse Tchegho, Dan Hannon, Julie Euber of TGen, Lauren Brito, Sandra Gonzalez and Alexis Abboud



2016 Key to the Cure Co-Chair Amy Thurston, guest speaker Jennifer Dunn, and Co-Chair Christine Watson



stepNout 5K Run | Walk | Dash raised more than \$150,000 for pancreatic cancer research.



Nadia Rivera and T.J. Isaacs, Vice Presidents of Development for TGen Foundation

Key to the Cure / Guys Night Out highlight cancer research

More than 150 guests enjoyed a morning of glamour, panache and inspiration at the 18th annual *Key to the Cure* Fashion Show and Breakfast, October 28 at Saks Fifth Avenue in Phoenix. ■ Co-chaired by Amy Thurston and Christine Watson, the event featured a special guest speaker in Jennifer Dunn, daughter of TGen President and Research Director Dr. Jeffrey Trent. ■ Wearing a chic scarf around her head, she recounted her experience as a 33-year-old mother of three who discovered she had breast cancer. She spoke movingly of how TGen's research is making a difference for patients like her. ■ "The most powerful moment of the morning was having Jennifer speak of her journey," said Mrs. Watson, a two-time breast cancer survivor. ■ The night before, more than 70 men gathered in the Saks men's department for the fourth annual *Guys Night Out*, where supporters learned about TGen's early detection research. ■ "TGen's work is necessary, groundbreaking and requires the support of our community," explained Terry Lee, who co-chaired *Guys Night Out* with David Watson. ■ *Key to the Cure* and *Guys Night Out* combined to secure more than \$180,000 for cancer research.

stepNout 5K Run | Walk | Dash raises \$150,000

More than 1,000 runners, walkers, survivors and supporters united to raise awareness, spirits and funds for pancreatic cancer research the 11th annual *stepNout 5K Run | Walk | Dash* on November 6 at Scottsdale Sports Complex. ■ The event raised more than \$150,000. ■ "When asked to be a part of this special event, I immediately said 'yes' because we need to make a difference in pancreatic cancer," explained Scottsdale Mayor Jim Lane. ■ Among the highlights at *stepNout* was the enthusiastic participation of 40 teams of families, friends and supporters. Team Lee led the way, raising more than \$58,000 in memory of Lee Hanley. First-year participants from Barb's Team-Kickin' Pancreatic Cancer came in second with almost \$20,000. ■ Save the date, Sunday, November 5, 2017, for the 12th annual *stepNout 5K Run | Walk | Dash*.

T.J. Isaacs, Nadia Rivera join TGen Foundation

TGen Foundation has added two dynamic new vice presidents, both of whom have deep ties in Arizona and strong commitments to patients and their families. ■ In August, the TGen Foundation named T.J. Isaacs, a respected fundraiser with nearly a decade of experience at Arizona State University and other major academic institutions, as Vice President of Development. He will be responsible for supporting TGen's groundbreaking research in neurogenomics, pathogen genomics, canine health and behavior, and the Center for Rare Childhood Disorders. ■ "I want to build a greater recognition in the community about the work that TGen is doing on a global scale," said Isaacs. ■ In November, Nadia Rivera joined the team from ASU's W.P. Carey School of Business. She led successful fundraising initiatives at the university for more than eight years. Rivera will be responsible for supporting TGen's innovative cancer research programs. ■ "For me, the cool part about coming to TGen is the implications of what we are doing for the future of medicine and how we will all be treated in the healthcare system," said Rivera. ■ Isaacs can be reached at tisaacs@tgen.org or 602-343-8473. Rivera can be reached at nrivera@tgen.org or 602-343-8470.

Pink Plymouth Duster auctioned at Barrett-Jackson Las Vegas

Lisa Koehnen wanted to learn how to drive a stick shift in a big, hunk of American steel. The cute Panther Pink 1970 Plymouth Duster crossing the block at the 2015 Barrett-Jackson Auto Auction in Las Vegas seemed just the ticket. Then she got behind the wheel of the 225ci Slant-6. ■ “My favorite color is pink and I’m a breast cancer survivor, but it was a little more than I could handle,” said Mrs. Koehnen, who lives with her husband on a farm in California. “It was a dragster, and I don’t think I’m gonna start drag racing at 50.” ■ The Panther Pink color was a favorite of street racers, and the Duster had undergone a complete restoration with Mopar high-performance parts. As cute as it was, this impulse buy almost gave her whiplash as she tried to manage the manual transmission. ■ Her husband Kalin suggested they donate the car to a breast cancer cause and when they passed by the TGen booth at Barrett-Jackson 2016 in Scottsdale, they found the perfect fit. ■ “I knew that Craig Jackson supported TGen, and I was very impressed,” she recalled. “After the chemo that I went through, I was very interested in individualized therapies, and I decided the car should go to TGen.” ■ Diagnosed 12 years ago, she underwent a single mastectomy and did not need chemotherapy or radiation treatment because it was caught so early. Two years later, she was diagnosed with lymphoma and suffered terrible side effects during a grueling chemotherapy regimen. ■ Exactly one year after she bought the pink Duster, Mrs. Koehnen offered it for auction at Barrett-Jackson Las Vegas in October. Not listed as an official charity car, bidding stalled at \$9,000 and it was being slowly eased off the block. “I told them I was donating the proceeds to breast cancer research,” she said. “They announced it, and it just pumped up the bidding to \$20,000.” ■ The hammer fell on the Panther Pink Duster at \$20,000. Following her donation to TGen’s breast cancer research, Mrs. Koehnen turned her attention to finding a more appropriate car for her stick shift ambitions: A vintage Ford Mustang. ■ Then she got a call from The Pink Agenda: She was the lucky winner of their raffle for a limited edition, pink, 2017 Volkswagen Beetle! It may not be a stick shift, but it is certainly the right color!



This 1970 Plymouth Duster was auctioned at the 2016 Barrett-Jackson Auction in Las Vegas for breast cancer research at TGen.



Clarion Builds donated a 1974 BMW 2002 to benefit TGen’s cancer research at the 2016 Barrett-Jackson auction in Palm Beach and raised \$125,000.

Upcoming Events Benefitting TGen:



To learn more about these events, please call the TGen Foundation at 602-343-8411 or visit: tgenfoundation.org/events

January 14-22, 2017

Barrett-Jackson Collector Car Auction [Scottsdale, AZ]

Benefitting colon and prostate cancer research.

www.barrett-jackson.com

April 1, 2017

3rd annual Casey’s Cup for ACC [Anaheim, CA]

A fun 3-on-3 ice hockey tournament for all age levels and abilities. It raises funds for Adrenocortical Cancer [ACC] research at TGen.

www.tgenfoundation.org/events

May 7, 2017

The 7th annual Cycle for the Cure [Various Locations, AZ]

Enjoy a heart-pumping, high-energy indoor spin event at the Village Health Clubs, in support of cancer research.

www.tgenfoundation.org/events



The 6th annual Cycle for the Cure brought in a record \$248,725 for TGen thanks to a gift of \$100,000 from Guarantee Trust Life.



Amjad Ali Khan greets patient Seth Belnap presenting a gift from TGen and the Center for Rare Childhood Disorders

Maestro salutes Center for Rare Childhood Disorders

East met west on September 3, and children with rare disorders from around the world were the winners.

Sarod virtuoso Amjad Ali Khan performed “Sarod for C4RCD,” a gala concert for TGen’s Center for Rare Childhood Disorders on Labor Day weekend at the Tempe [Ariz.] Center for the Arts.

“This is a very laudable cause, a very important cause, a very useful cause, so we are very happy to be able to serve this cause,” said Maestro Khan, a sixth-generation sarod player.

Maestro Khan performed with his son Ayaan Ali Bangash on the sarod, a lute-like stringed instrument of India. Joining them on stage were Grammy-nominated violinist Elmira Darvarova and tabla percussionist Anubrata Chatterjee.

Many patrons wore colorful Indian saris and sherwani. More than \$40,000 was raised to benefit TGen’s rare disease research.

Sarod for C4RCD was the idea of Indian-born Dr. Vinodh Narayanan, Professor and Medical Director of TGen’s Center for Rare Childhood Disorders. In July 2015, Dr. Narayanan met Maestro Khan and invited him to perform. A team of dedicated volunteers coalesced around making the benefit concert a reality.

“For many of the patrons, this was the first opportunity to hear the Maestro in person, and they loved the music,” explained Dr. Narayanan. “Each one of the people who reached out to me that evening told me how touched they were by the story of C4RCD and the families that we have been able to help. The message always was ‘thank you for what you do for families affected by these rare disorders!’”

Maestro Khan has played at leading venues throughout the world, including Carnegie Hall in New York, Royal Albert Hall in London and the Sydney Opera House in Australia.

At the conclusion of Sarod for C4RCD, Maestro Khan was moved by gifts of chocolates and traditional silk shawls, presented by patients from the Center. The performance united patrons from diverse cultures and backgrounds, gathering together to support life-saving research.

“The seven notes – do, ray, mi, fa, so, la, ti – this is the basis of any music, any country, any system,” Maestro Khan said. “Music captures your heart. It captures your emotions. It has connected the world.”